MARINE REVIEW

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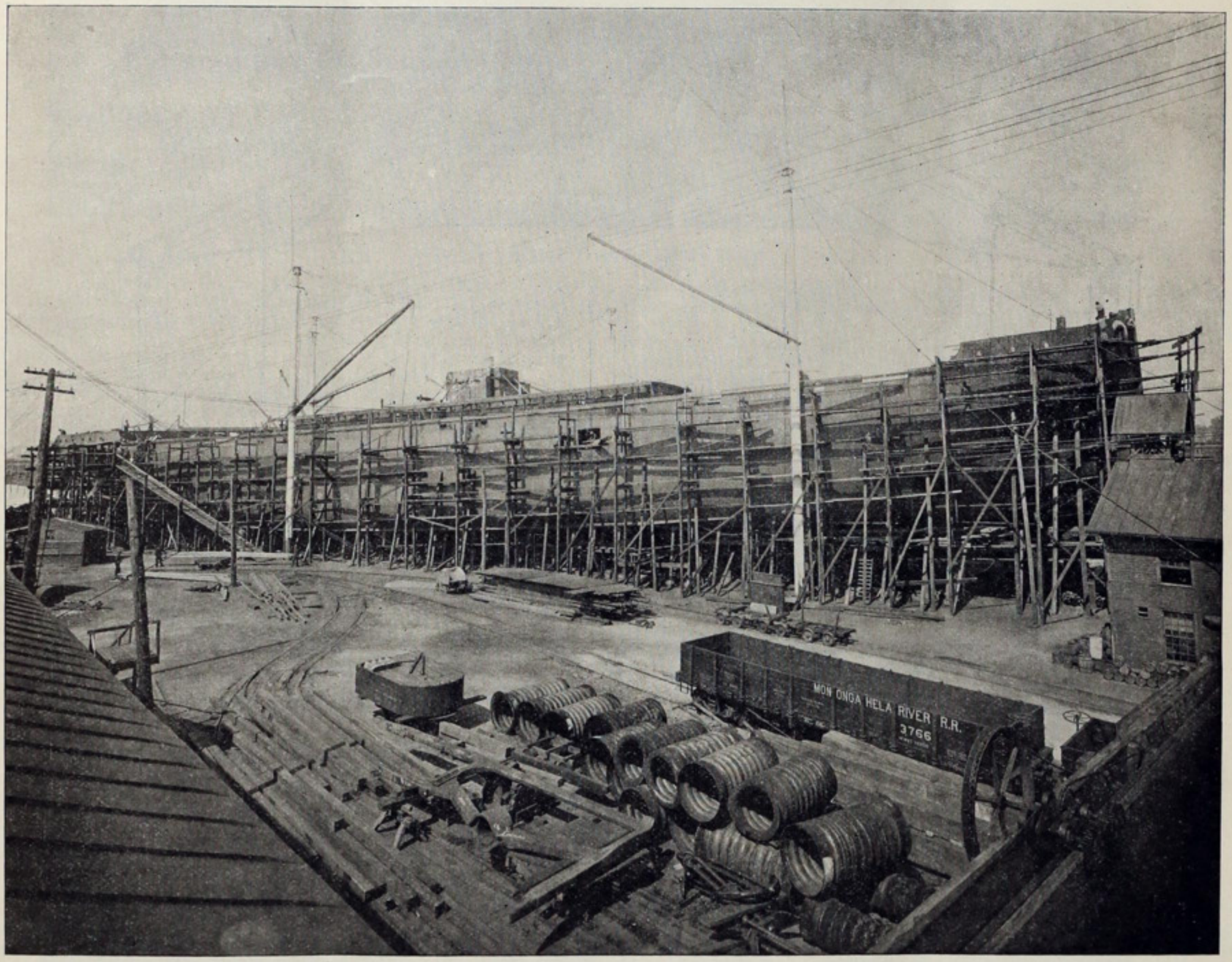
LAUNCH OF THE STEAMER PONCE.

Wilmington, Del., July 19.—The Harlan & Hollingsworth Co. will launch next Saturday, July 22, at noon, the new freight and passenger steamer for the New York & Porto Rico Steamship Co., to be christened Ponce by Miss Elizabeth B. Gilpin, daughter of Ferdinand L. Gilpin of Wilmington, Del. Representatives of the New York & Porto Rico Steamship Co. will arrive in Wilmington about 11 o'clock and after a lunch by the local firm will proceed to witness the launch. The Ponce is built to Lloyd's rules, under the supervision of Mr. John Haug. She is 335 feet over all, 317 feet between perpendiculars, 322 feet on water line, 42 feet beam, and of 19 feet load draught. Other particulars of this vessel are: Dead weight carrying capacity, 3,250 tons; six water tight bulkheads; four winches; Hyde steam capstan-windlass; Hyde capstan aft; two steel masts; deck house of steel; accommodations for seventy-two first-class and twenty second-class passengers; double electric lighting plant with 232 lights; evaporator with a capacity of 15 tons; five water tanks of 8,000 gallons capacity; engines of direct tri-compound type with inverted cylinders, 24, 38 and 62 inches diameter and 42 inches stroke; speed 12 knots; single screw; two steel Scotch boilers, 14 feet 6 inches diameter and 11 feet long, with six furnaces of 48 inches diameter; boiler pressure 180 pounds; Ellis & Eaves induced draft; bunker capacity 350 tons. The Ponce is building under inspection of the American Bureau of Shipping, No. 37 William street, New York, for classification in the Record of American and Foreign Shipping, of which Mr. E. Platt Stratton is chief surveyor.

In about two months the launch of this vessel will be followed by that of her sistership, the San Juan, building for the same firm, but previous to the San Juan's launch the steamer Maracaibo for the Red D line will go overboard. Immediately after the Ponce leaves the ways the new ship for the Metropolitan Steamship Co. of New York will be laid down. In addition to this work, the Harlan & Hollingsworth Co. has under construction two steamers for the New York & Baltimore Transportation Co.; the steamship Grecian for the Boston & Philadelphia Steamship Co.; torpedo boat destroyers Hopkins and Hull for the United States government, and also the torpedo boat Stringham, which will have her trial some time during August. It is confidently expected that the Stringham will exceed her guaranteed speed of 30 knots. This, in connection with the many ships at the wharves undergoing repairs, together with the large amount of car work, makes the Wilmington works a very busy place.



STEAMER PONCE ON THE WAYS AT THE HARLAN & HOLLINGSWORTH CO.'S YARD, WILMINGTON, DEL.

CARGO RECORDS—FREIGHT CARRIERS OF THE GREAT LAKES.

The 8,000-ton mark has been exceeded in a cargo of iron ore just delivered at South Chicago from Two Harbors by the steel barge Manila of the Minnesota Iron Co.'s fleet, and the cargo record is again broken. It will be understood, of course, that the tons are net tons of 2,000 pounds. The Manila was drawing 18 feet even. This barge is 436 feet keel, 50 feet moulded beam and 28½ feet moulded depth. The bill of lading weight of the cargo was 7,326 gross tons, which with 1 per cent added for moisture, on which no freight is paid to the vessel, is equal to 8,237 net tons. Cargo records corrected to date are:

Iron ore—Steel tow barge Manila, owned by Minnesota Steamship Co. of Cleveland, 7,399 gross or 8,237 net tons, Two Harbors to South Chicago, draught of 18 feet; steel barge John Fritz, owned by Bessemer Steamship Co. of Cleveland, 7,100 gross or 7,952 net tons, Duluth to Conneaut, draught of 17 feet 10 inches; steamer Henry W. Oliver, owned by Wilson Transit Co. of Cleveland, 7,014 gross or 7,856 net tons, Ashland to Cleveland, draught of 17 feet 10 inches.

Grain—Steamer Superior City, owned by A. B. Wolvin of Duluth, 266,550 bushels of corn, equal to 7,463 net tons, South Chicago to Owen Sound, draught of 18 feet 2 inches; steamer Superior City, owned by A. B. Wolvin of Duluth, 200,000 bushels of wheat and 41,800 bushels of flax, equal to 7,175 net tons, Duluth to Buffalo, mean draught of 17 feet 3 inches; steamer Andrew Carnegie, Wilson Transit Co. of Cleveland, 332,100 bushels of oats, equal to 5,313 net tons, Manitowoc to Buffalo.

Coal—Steamer Hendrick S. Holden, Capt. John Mitchell and others, Cleveland, 6,432 net tons of anthracite, Buffalo to Duluth on a draught of 17 feet 8 inches forward and 17 feet 1 inch aft.

EXPERIMENTAL MODEL BASIN.

THE TESTING TANK INSTALLED BY THE BUREAU OF CONSTRUCTION AND REPAIR, NAVY DEPARTMENT, AT THE WASHINGTON NAVY YARD.

In its annual naval edition, issued in August, 1898, the Marine Review was enabled to print the first description and illustration of the tank for experiments with models of vessels, which was installed last year at the Washington navy yard. Now that the work of construction is complete, we are enabled, by the courtesy of Philip Hichborn, chief of the bureau of construction and repair, to present a number of photographs, a cross section of the structure, and the following description:

The value of towing experiments upon small-scale models of ships for the purpose of deducing the resistance of a full-sized ship from that of the small model, was demonstrated by the late Mr. William Froude, who at his own expense started a small tank for such experimental work at Torquay, England, about 1870. The English admiralty subsequently recognized the value of his work and assisted him in it, later building a larger basin at Haslar, near Portsmouth, which is now in charge of Mr. R. E. Froude, son of Mr. William Froude. Other governments, notably Italy and Russia, were induced to establish model basins, which were largely copies of Froude's basin; and one firm of private builders, Denny Brothers of Dumbarton, Scotland, were sufficiently enterprising to build a basin for their own use.

The construction bureau of our navy department has appreciated for many years the value of an experimental basin, but it was for a long time unable to secure an appropriation for the purpose. Congress finally, about two years ago, granted $100,000 for this work, the grant being largely due to the efforts of the late Congressman Hilborn. The basin proper was completed the latter part of last year, and the special machinery and apparatus have now just been completed and installed, after a good deal of delay due indirectly to the war with Spain. The basin is located in the southeast corner of the Washington navy yard. The accompanying half-tones, Figs. 1 and 2, give a very fair idea of the external and internal appearance, and Fig. 3 shows the construction of the main body of the tank proper. The building is 500 feet long and about 50 feet wide inside. The water surface of the basin is slightly shorter than the building, being about 470 feet long. The deep portion is about 370 feet long, the south end, from which the runs begin, being shallow. The water surface is 43 feet wide, and the depth from top of coping to the bottom of the basin is 14 feet 8 inches. The basin is materially larger than any other in existence. The nature of the ground was such as to render the construction of a thoroughly tight and stable basin somewhat difficult; but owing to the small space available at the Washington yard, it was necessary to locate it upon its present site. The bottom of the basin proper is made up of a layer of broken stone, upon which is a thin layer of concrete, then a half-inch of Neuchatel asphalt, then about 9 inches of concrete in 16-foot lengths; the keys between the various lengths being filled with Bermudez asphalt, and the whole inside surface covered with the asphalt. The heavy side walls are 6 feet thick at the bottom, 6 feet deep, and about 4 feet 6 inches thick on the top, not counting the molded stone coping. They are in 40-foot lengths, with a square key between adjacent lengths filled with Bermudez asphalt. The side walls rest upon a double row of piles, and in addition there is sheet piling completely around the deep part of the tank. The shallow part of the tank at the southern extension is also carried on piling, as it actually overhangs the water.

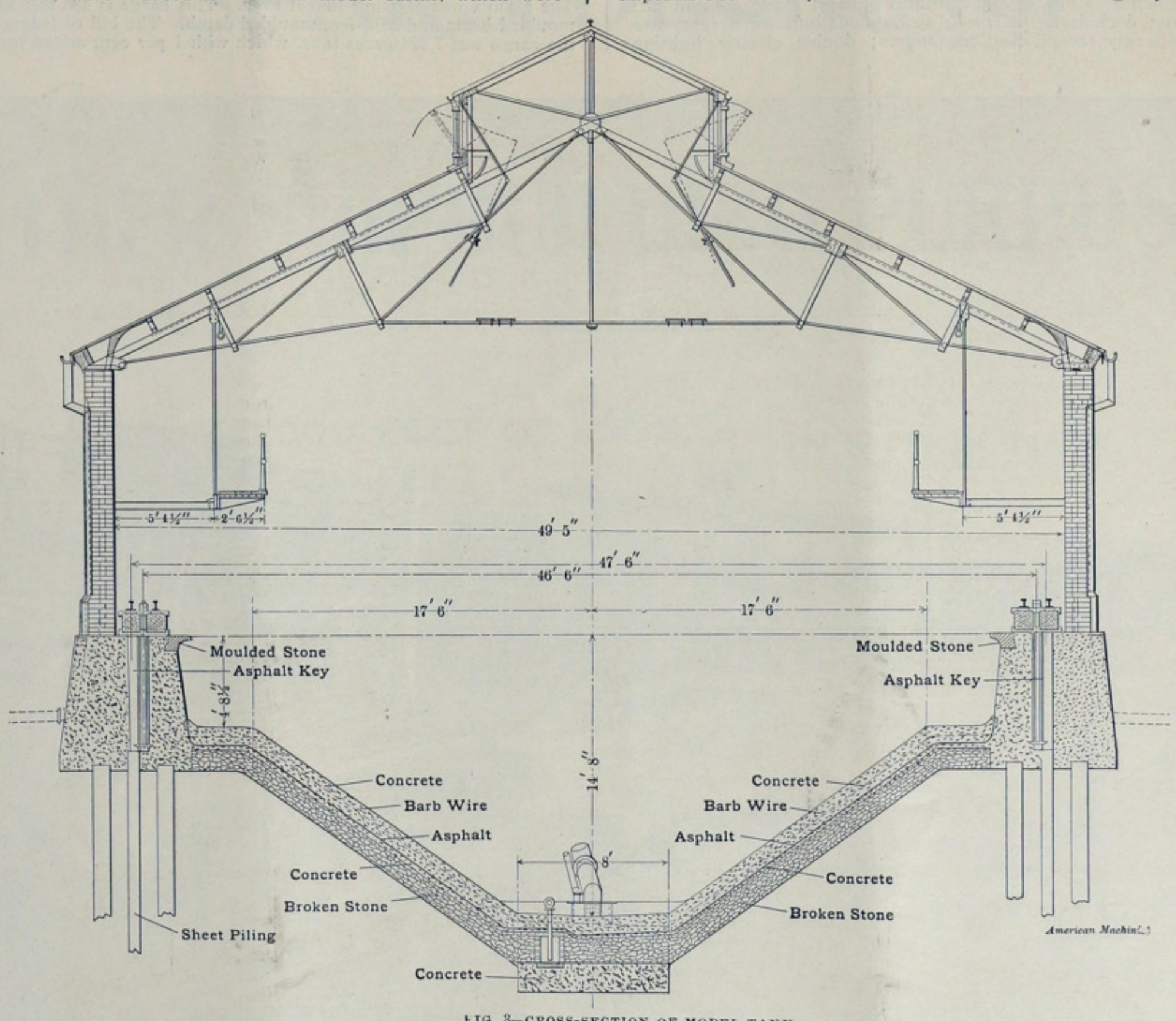


FIG. 3—CROSS-SECTION OF MODEL TANK.

The law authorizing the construction of the model basin also authorized experiments to be made for private ship builders, provided they defrayed the actual cost of the same; it being understood, of course, that such experiments should not interfere with naval work. This being the case, it was necessary to lay out the plant with a view to the rapid and economical turning out of routine experiments, and to this end the endeavor has been throughout to use machinery for as many of the operations as possible. The foreign tanks invariably use paraffine for the construction of models, and generally make them from 10 to 14 feet long. The climate of Washington is so warm in the summer that it was found impossible to obtain paraffine which would retain its rigidity satisfactorily, and, moreover, it was the desire of the bureau of construction and repair to make the models as large as possible, thus eliminating one source of inaccuracy in applying the model experiments to full-sized ships. For these reasons wood was adopted as the material for the models, and after some difficulty a satisfactory varnish was found which rendered the surface of the wood to all intents and purposes water-tight. The standard length of model used is 20 feet. A model 20 feet long may not seem much larger than one 12 feet long, but when it is remembered that the displacements of these two are, respectively, as 8,000 and 1,728, it will be seen that the 20-foot model is nearly five times the size of the 12-foot model.

The method of building the models is as follows: The "lines" of the ship invariably include a body plan giving sections at moderately close intervals. From this body plan new sections are drawn to the proper size for a 20-foot model, by means of the eidograph or large pantograph shown in Fig. 4. These sections are cut out of paper and then transferred to wooden boards, which are sawed to shape. These boards are then erected in their proper relative positions upon the erecting table shown in Fig. 5, each board section being clamped in a vertical plane. They are then covered with battens about ½ inch thick and tapering from midships towards the end, making a "former" model, the surface of which is planed smooth. In cutting out the sections allowance is made for the thickness of the battens which are to be nailed upon them. Meanwhile a rough block of shapes and dimensions, to enable the finished model to be cut from it, has been prepared and glued together under pressure in a large hydraulic press. This block is placed upon the upper table of the model-

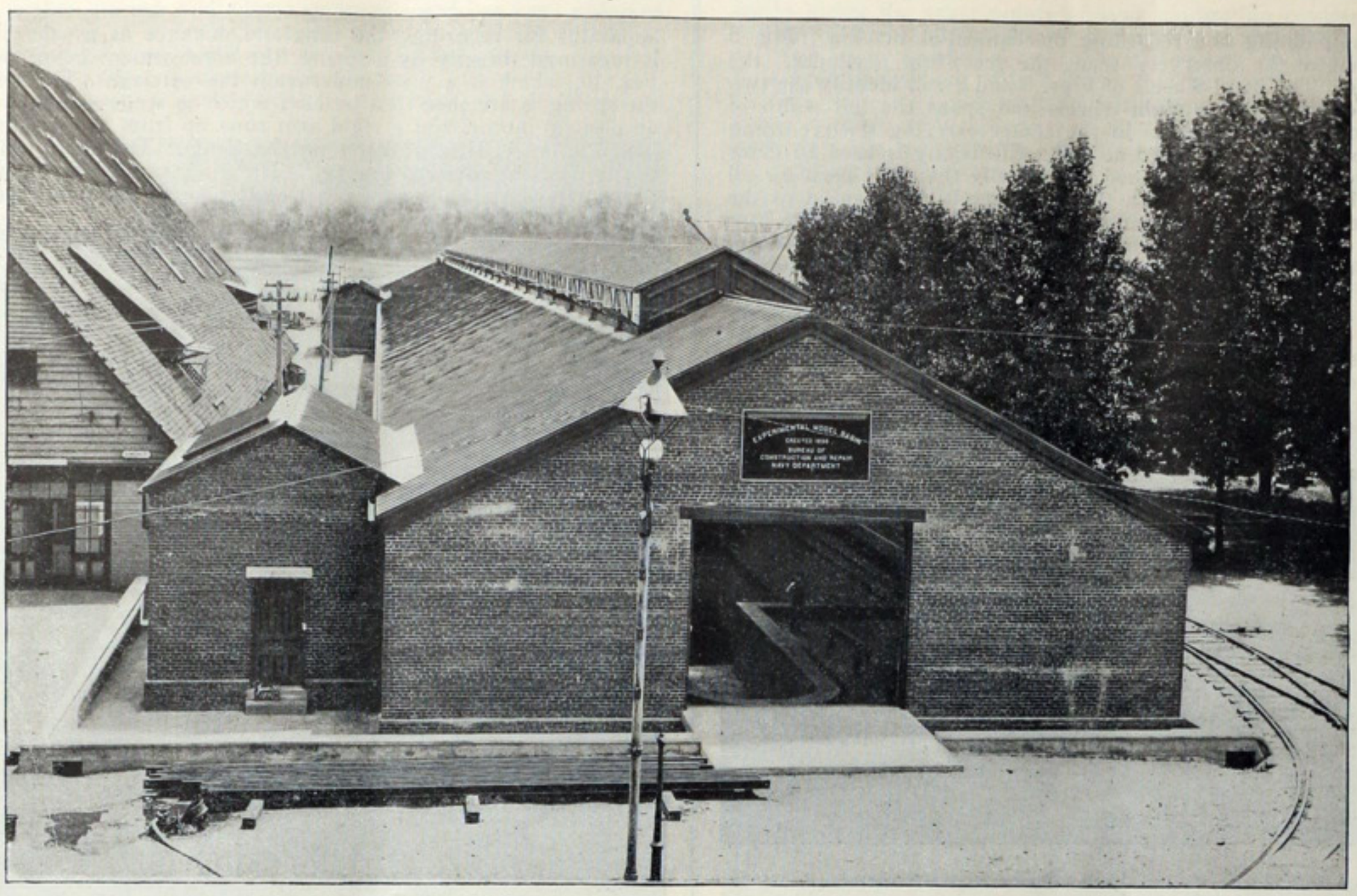


FIG. 1—EXTERIOR VIEW OF MODEL BASIN.

cutting machine, illustrated in Fig. 6; the "former" model being placed upon the lower table, both as shown. The model-cutting machine works upon the principle of the Blanchard lathe, a roller traversing the surface of the "former" model, and saws or cutters working upon the surface of the model proper, the pantographic construction of the machine causing the saw or cutter, as the case may be, to reproduce the section of the "former" model. There are two of these machines, one each side of the model-carrying frame. In the picture the arm of the further machine, with a saw in position, is seen above the model, while the machine nearest the observer is fitted with a cutter. The machines are located in successive positions along the model, and parallel saw cuts are made over its entire length. The saws are then removed, cutters of the same diameter are substituted, and the surface is brought very close to the desired shape. The model is then removed from the cutting machine and finished by hand; a very small amount of hand work, however, being found necessary. It is then ready for varnishing, and the attachment of any appendages, such as bilge keels, struts, etc. It is finally taken to the measuring machine, shown in Fig. 7, and careful measurements made of its exact form and shape, which not only enable the staff to determine whether the model represents the lines desired, but give an exact record of the actual shape.

Fig. 8 shows the carriage or traveling bridge in place over the tank, the reflection from the surface of the water causing it and the roof lines to be reproduced below. The towing bracket will be seen below, and

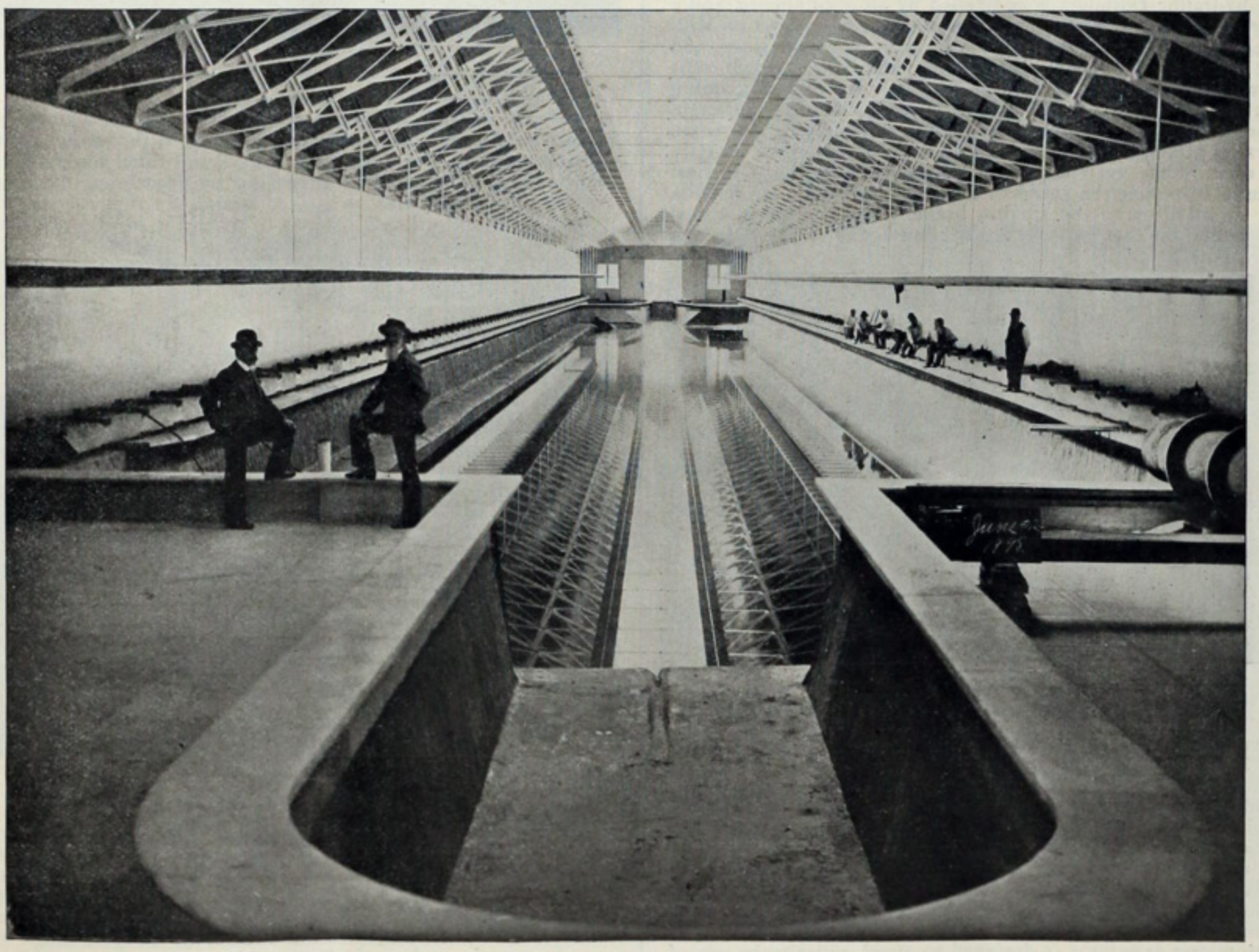


FIG. 2—INTERIOR VIEW OF MODEL BASIN.

some of the manipulating and recording mechanism is in view. Fig. 9 gives a near view of the observers' seats, the recording cylinder, the switch-board, etc. The hand-wheels of Figs. 8 and 9 will identify the two views. The bridge runs upon eight wheels and spans the full width of the basin as shown. The platform in the center carrying the recording apparatus can be raised or lowered at will. Electricity is used to drive the carriage, and it may be mentioned incidentally that it is used for all mechanical work in connection with the model tank. The speed of the carriage is varied not only by making various combinations of the four motors—one to each pair of driving wheels—but by controlling the output of the generator in the power station, which is perhaps 100 yards from the tank. This control is on the Ward-Leonard system, and in practice it is found that a very exact regulation of speed is obtained by this combination. The carriage itself, with its fittings, weighs in the neighborhood of 25 tons, so that it alone forms a kind of fly-wheel and is not subject to sudden variations of speed. The speed of the carriage can be varied from 1-10 knot an hour, or ten feet per minute, to 20 knots an hour, or 2,000 feet per minute. The principal difficulty in connection with

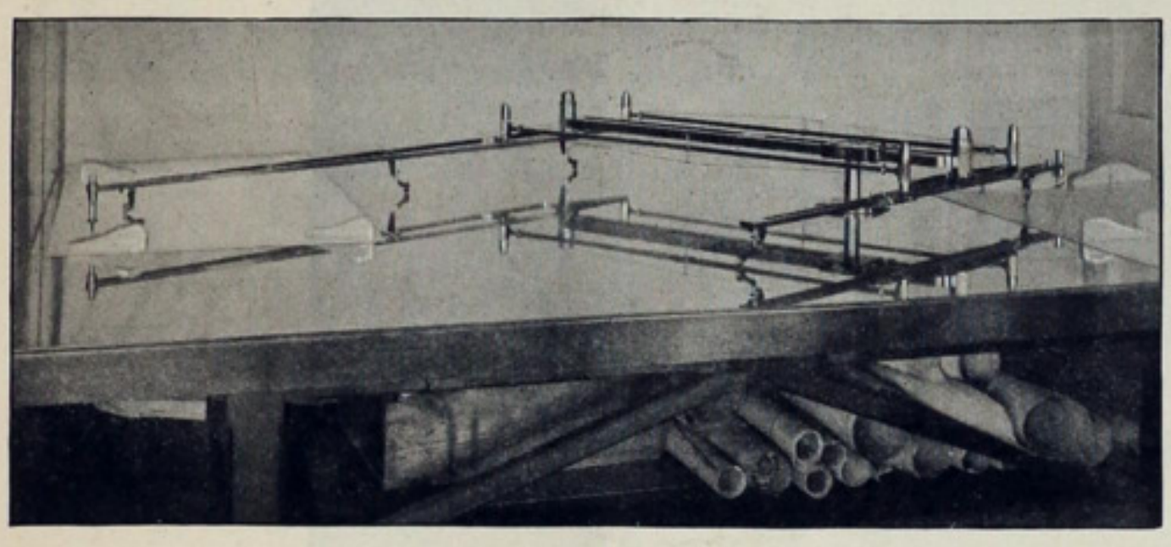


FIG. 4—PANTOGRAPH FOR REPRODUCING SECTIONS OF SHIPS.

the use of high speeds, which, while not necesary for the bulk of the experiments, will be of great value in certain special experiments, is to stop the carriage when it is once under way. The electrical control acts as a brake, because when the current is shut off the motors become generators, but this could not be relied upon for high speeds, since the sudden rush of current due to possible unskillful manipulation would throw the circuit breakers, thus opening the circuit and cutting off the current entirely. For these reasons there is at the north or terminal end of the basin a double system of brakes to take hold of the carriage. The first is a friction brake consisting of two strips of iron on either side, pressed together by hydraulic cylinders. These are forced apart by a slipper on the carriage about 10 feet long, which, as well as the brake strips, is kept thoroughly oiled, so that the coefficient of friction for stopping, though low, is fairly definite, and sudden jerks are avoided. The pressure in the hydraulic cylinders is controlled by an accumulator and a pump driven by electricity. Great care has been taken in connection with this part of the installation, that it may be always in working order, and any trouble or break-down, except that of the pump itself, which runs all the time, will simply result in setting the pressure at a maximum This maximum is 600 pounds, but it has been found by actual experiment that with 500 pounds pressure the carriage is brought safely to rest when it enters the brakes at a speed of 20 knots. It is not expected in practice to repeat this often, since even for the high-speed runs the electrical brake will be used to reduce the speed of the carriage before the friction brake is used. In addition to the friction brake, there is what is called the emergency brake; so that in case the friction brake fails for any

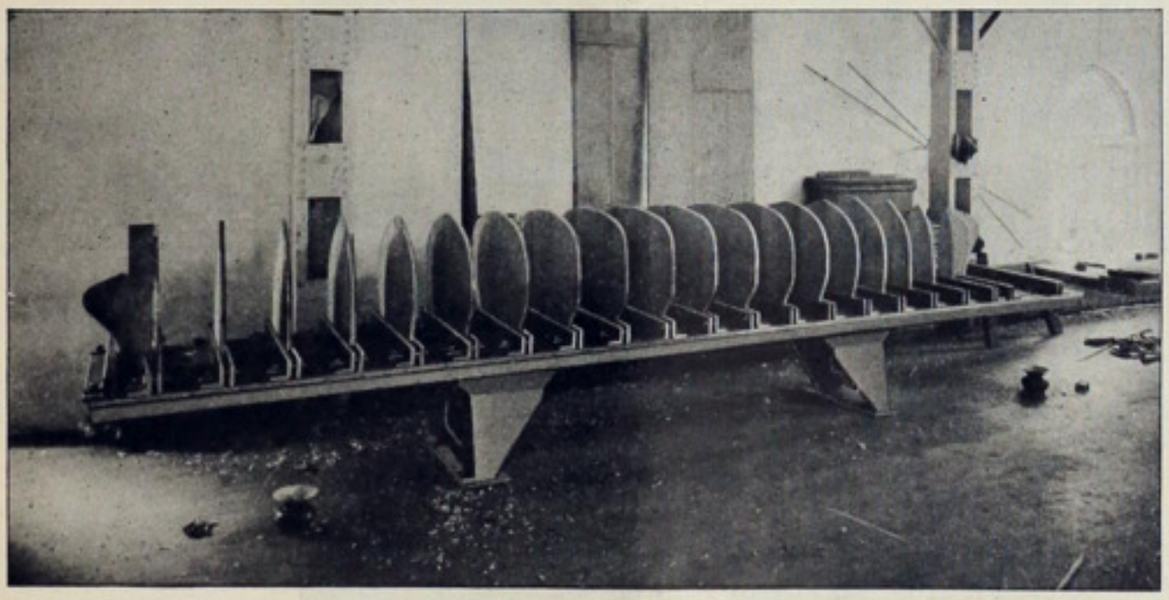


FIG. 5—SECTIONS OF FORMER MODEL ON ERECTING TABLE.

reason, the carriage will still be caught. This brake consists simply of a piston about 16 inches in diameter working in a cylinder which is submerged in the water of the tank, and connected by wire cables to a hook which takes hold of the carriage. The head of the cylinder has a round hole, and the piston rod is tapered so that as the rod is drawn out by the motion of the carriage, the hole is gradually closed, the whole being almost exactly upon the principle of the hydraulic gun recoil brake. An escape is provided for the water around the piston when it starts from rest, to avoid sudden accelerations from the whole mass of water in the cylinder.

The dynamometric apparatus is designed to avoid entirely the use of multiplying levers or other devices involving the possibility of friction, and here again electricity is enlisted. The recording drum is fitted with apparatus for recording the time and distance as usual. The resistance is measured directly by a spring, the arrangement being as indicated in Fig. 10, which is a view underneath the carriage. The forward end of the spring is attached to a bracket which is screwed forward or back by an electric motor, and a rigid arm runs up from the bracket, carrying a pencil to record its position on the drum. The record then is of the position of the forward bracket. The after end of the spring takes hold of a small cross-head to the other end of which again is attached a towing

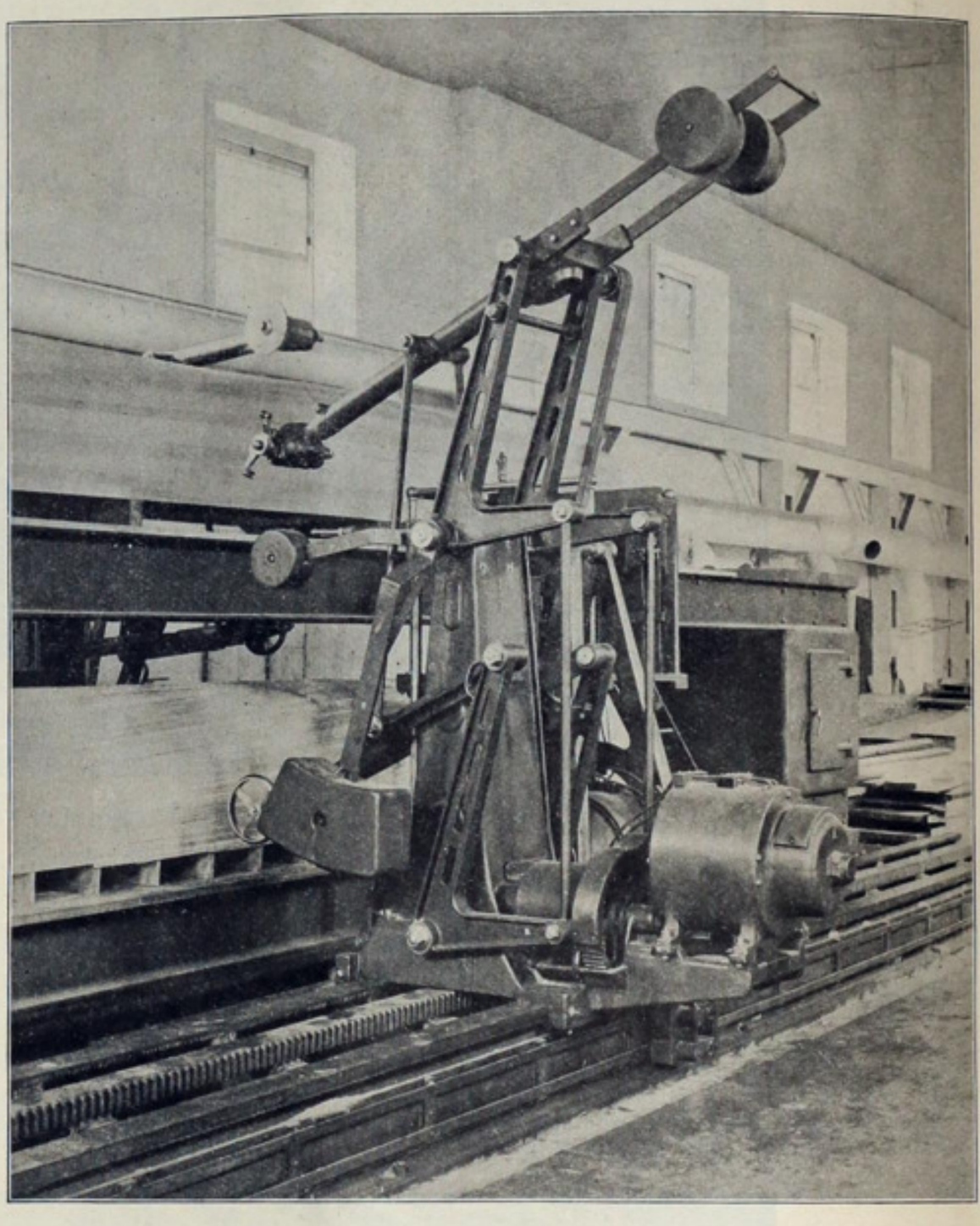


FIG. 6—MODEL-CUTTING MACHINE.

rod which takes hold of the model. This cross-head has a very slight play between stops in the after fixed bracket, and when it touches either stop closes an electrical contact which again throws an electric clutch by means of which the motor running all the time, screws forward or back the forward bracket, thus increasing or decreasing the tension of the spring until the contact is opened again. In this way the resistance pen has to move but a small distance to reach the position of equilibrium, and

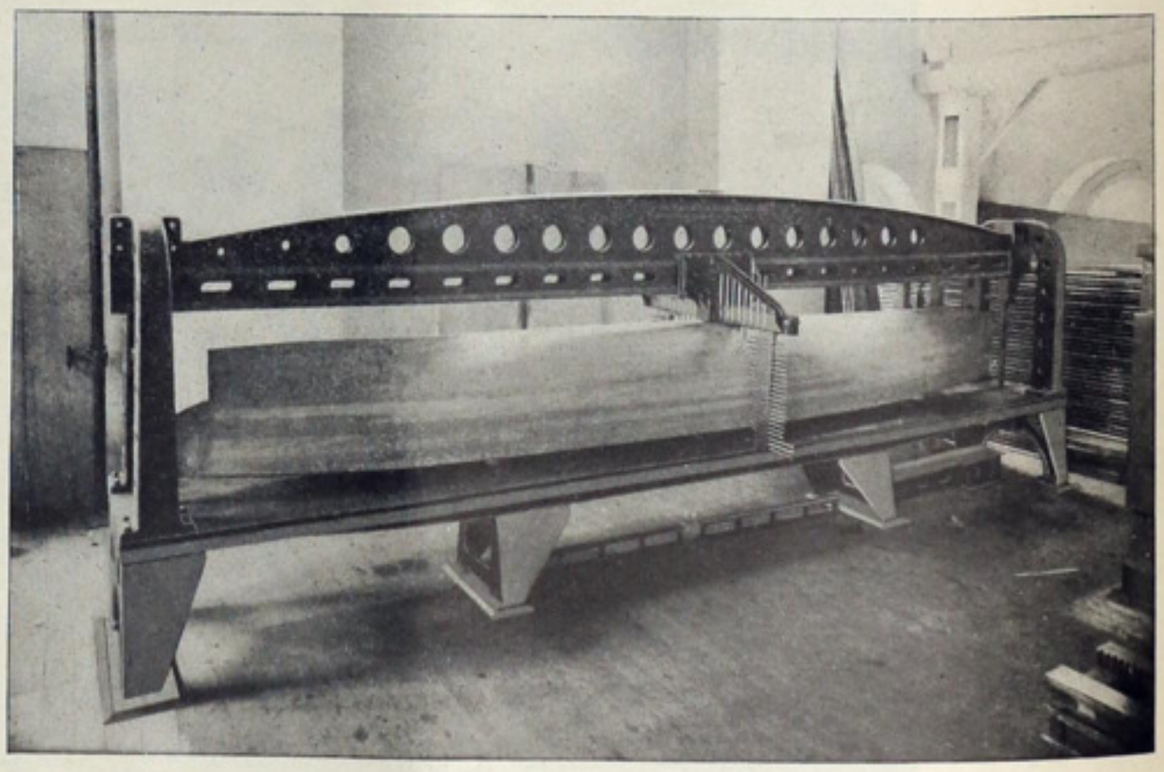


FIG. 7—MODEL-MEASURING MACHINE.

almost immediately becomes steady. It will be seen that with this device friction is eliminated. The accuracy obtainable depends upon the closeness with which the automatic stops at the after end of the spring can be set. In practice it is found that these can be set to give a play of about the fiftieth of an inch, and as the springs will extend 10 inches, the results obtained are practically exact as indicating the pull of the spring.

In practice, when about to make a run, the operator works the bracket forward to the immediate vicinity of the position which he knows it will assume during the run, the approximate speed of which he knows.

The carriage is then started, and after a uniform speed has been obtained (which, for speeds up to 12 knots, is done within 50 feet), he throws in by a single motion of one handle the automatic appliances which start the drum and record time, distance and resistance.

A weighing apparatus is provided at the starting end of the basin,

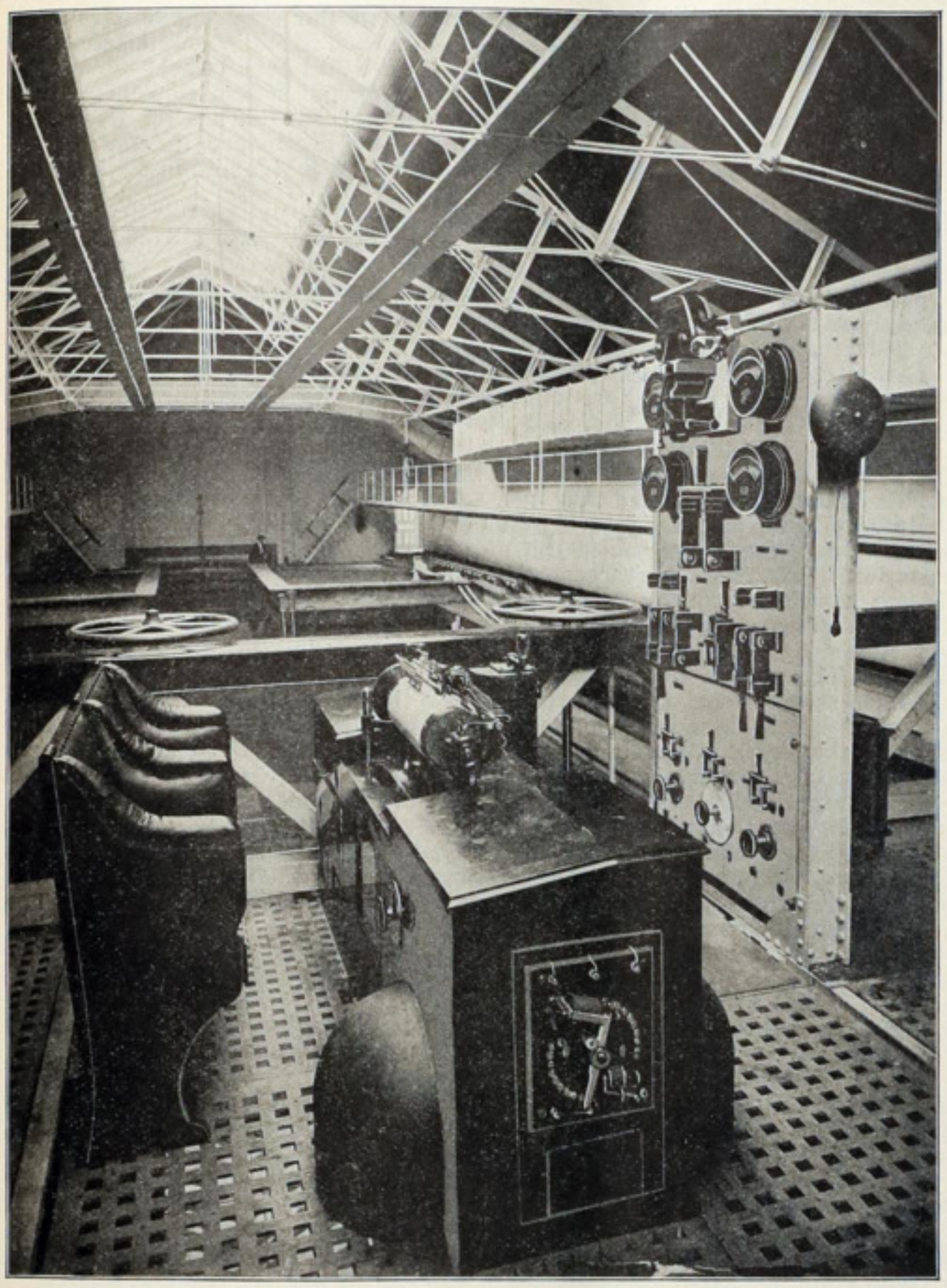


FIG. 9—OPERATING AND RECORDING MECHANISM OF TRAVELING BRIDGE.

by which the towing spring is calibrated by comparison with dead weights, the value of a given position of the pencil on the drum being determined positively, and regardless of the theory of springs or of temperature or other corrections. In connection with this, a set of fixed pens may be set to locate the exact points of such calibration readings as come near the anticipated readings during a given set of experiments.

The basin is filled from the water system of Washington, and will hold 1,000,000 gallons. The leakage from the basin, which is very slight, and the evaporation, are made up with filtered water, an animal bone filter being installed with a capacity of from 50 to 100 gallons per minute, depending upon the turbidity of the water. In practice a small stream of fresh filtered water is kept running into the basin all the time, and the level maintained wherever desired by an adjustable overflow.

The building and tank or basin proper were designed by the bureau of construction and repair, as well as the machinery for making models. The electrical installation was fitted by the General Electric Co., many of the electrical details of design being also due to them. The carriage proper was built by William Sellers & Co.; the dynamometer apparatus partly by Sellers & Co. and partly by Saegmuller of Washington, who also built the large eidograph. All of these are from the designs of the

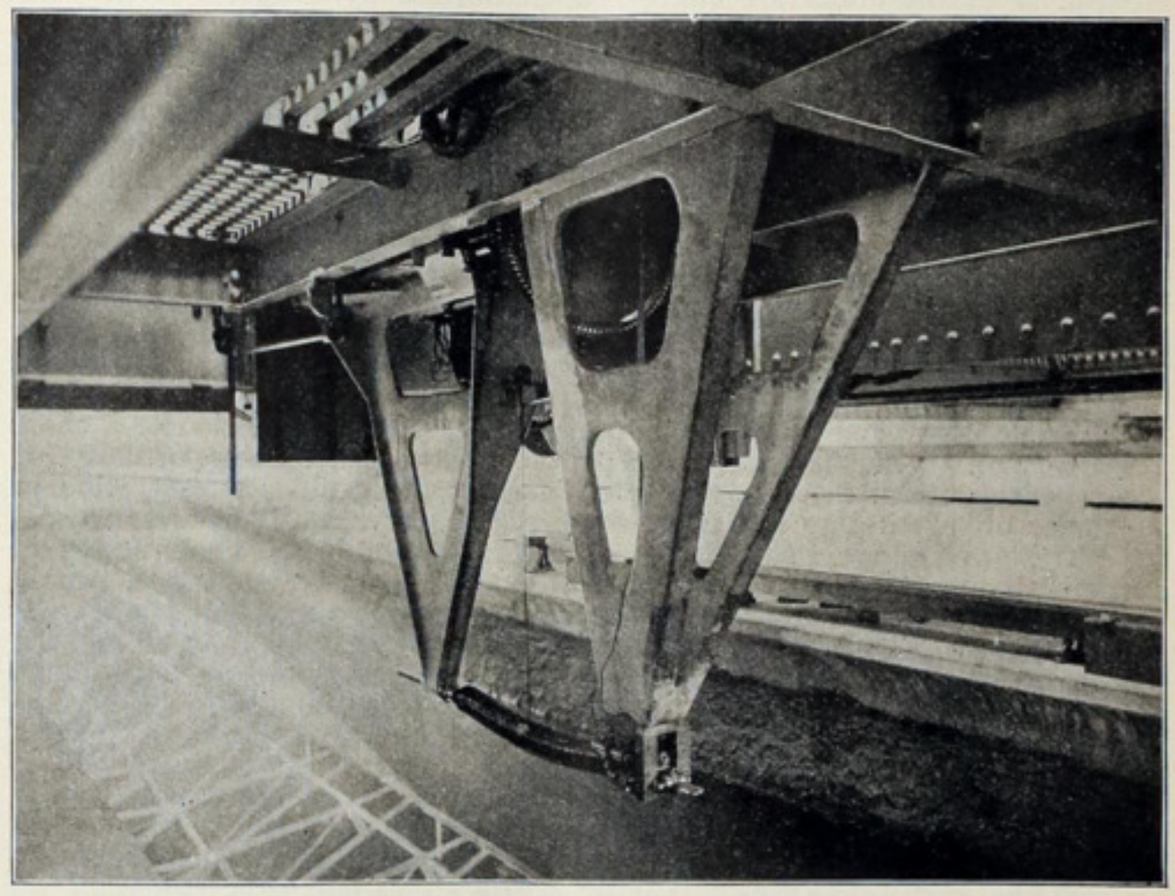


FIG. 10—DRAFT SPRING AND ATTACHMENTS UNDERNEATH BRIDGE.

bureau of construction and repair. The model-cutting machinery was built by Detrick & Harvey of Baltimore, Md., to the designs of the bureau of construction and repair. Naval Constructor Taylor has been in immediate charge of the work from its inception.

The model basin itself is now at work upon experiments to determine frictional coefficients of varnished surfaces and other constants needed in its use. Experiments are being made as opportunity serves upon models of the naval vessels already built and tried, for the purpose of accumulating data which will be constantly needed during the life of the tank. As soon as preliminary lines of the new third-class cruisers authorized at the last session of congress are completed, experiments will be made with them in the tank with a view to introducing any refinements or improvements found desirable. All the apparatus described has been tested and found to work satisfactorily.

FIG. 8—INTERIOR VIEW OF TANK WITH TRAVELING BRIDGE IN PLACE.

WOODEN DRY DOCKS.

THE NAVY DEPARTMENT MAY CONSTRUCT THEM FROM NECESSITY BUT NOT FROM PREFERENCE—REPAIRS ON THE DAMAGED BROOKLYN DOCK.

Washington, D. C., July 17.—Special Cor.—The recent collapse of the wooden dry dock at the Brooklyn navy yard is being very appropriately used to enforce the lesson furnished by experience with that class of naval structure and to urge the navy deparment to abandon the scheme for the construction of the wooden docks at League island and Mare island. There is evidently a misunderstanding on the part of many advocates of the stone or concrete dock in Philadelphia and elsewhere touching the attitude of the navy department with regard to the materials from which docks shall be constructed, and particularly in regard to the proposed wooden docks at League and Mare islands. In consequence of this error the department is made the object of severe and unjust criticism. So far as the docks are concerned, authorized by congress to be constructed at these two navy yards, there is no discretion lodged with the secretary of the navy. The law requires that these two docks shall be constructed of wood. The docks authorized in this same act to be constructed at Boston and Portsmouth are to be built of stone or concrete, and this change was secured through the recommendations of the navy department and the vigorous efforts of Representative Boutelle and other New England men in the house of representatives.

The secretary of the navy and the chief of the bureau of yards and docks are advocates of stone but they can do nothing in the way of substituting that enduring material for the wood ordered by congress. In the belief that congress at the approaching session can be induced to reconsider the action of the last congress and substitute stone for wood, the department delayed preparing the specifications for the dock at League island and inviting proposals, and these were issued only a short time ago. In furtherance of this plan to give congress an opportunity for reconsideration, there was inserted in the specifications a reservation in favor of substituting stone for wood. The reservation is in these words: "The government also reserves the right to modify the construction of this dry dock from one of timber to one of concrete and stone, should congress so authorize, and in the event of such change being made the revised plans will be prepared by the bureau of yards and docks, and the increased price to be paid the contractors in consequence of such change will be determined by a board of officers." The navy department may be relied upon to make a vigorous recommendation to congress to build a stone dock at League island.

Admiral Endicott, chief of the bureau of yards and docks, who is now in New York inspecting the injury to dry dock No. 2, has made a partial report, in which he says that it will probably take ten months to put the dock into shape. It is by no means certain that temporary repairs cannot be made in the meantime which will enable the department to continue to use the dock. Plans had hitherto been prepared and an appropriation amounting to $300,000 secured for the purpose of reconstructing this dock. It was originally a fine dock, but was much injured through the construction of the big timber dock No. 3 in its immediate vicinity. It had shown signs of weakness for some time, and just before the war an appropriation was secured to rebuild it, but the department was prevented from entering upon the work, first through the superior claims of other works and latterly through the necessity for fitting out the North Atlantic squadron for the maneuvers now in progress. Only last Wednesday this particular dock was occupied by the cruiser Detroit and had the accident happened at that time it might have resulted in the ruin of that ship. The plans for reconstruction involve the substitution of concrete at the entrance of the timber abutments. Once these are in place it will be a comparatively easy matter from time to time to substitute stone for the timber lining in the present dock.

GREAT VALUE OF CELLULOSE IN WAR SHIPS.

Lewis Nixon, ex-naval constructor, but now ship builder of Elizabethport, N. J., is quoted as saying recently that the discovery and application of cellulose is of as much importance to our navy as the development of Harveyized armor and smokeless powder.

"The value of some light substance that will preserve the stability of light armored vessels by displacing water that might enter after a projectile," says Mr. Nixon, "has been appreciated by naval constructors ever since we began to build steel armored vessels. No thoroughly satisfactory cellulose material was discovered until the pith of cornstalks was utilized in its manufacture. Corn pith is a perfect obturator. It absolutely prevents water from coming in by the opening made by an 8-inch shell. When chemically treated it is thoroughly fireproof and in every way meets the requirements of the situation. The fact that maize is an exclusively American product gives us an immense advantage over other nations. For keeping out water a cellulose belt of three feet may be said to be about as efficient as a 6-inch belt of steel. Our cruisers of the Baltimore type, if they are provided with a cellulose belt, would be warranted in engaging many of the second-class ironclads of other powers; without it they are liable to be sunk by a well directed machine fire. The discovery and application of cellulose is of as vital importance to our navy as the development of the Harveyized armor and smokeless powder. This follows from the fact that without adding very much to the cost of our vessels we can greatly increase their efficiency by making their sides automatically resist the inflow of water, and as our cruisers carry heavier batteries than similar vessels of other nations they would, when so protected, be able to give battle to ships far heavier than themselves."

The work of fitting the battleship Iowa with bilge keels has been completed at Seattle, Wash. About fifteen days were required for the work. The battleship Massachusetts was fitted with bilge keels in sixteen days in New York at the close of the war, but twenty-six days was consumed in a similar job on the Oregon. One of the side plates of the Iowa, which was buckled in a collision with the Merrimac during the Spanish-American war, was removed, straightened and replaced. The vessel was also repainted and will now have a green bottom with a 1-foot strip of red at the top.

LIFE SAVING SERVICE OF THE GREAT LAKES.

UNSATISFACTORY CONDITIONS THAT SHOULD ENLIST ATTENTION FROM THE VESSEL INTERESTS.

Buffalo, July 19.—The life-saving service of the great lakes is in a condition that ought to enlist careful attention from some interested body like the Lake Carriers' Association, for it has been treated by congress in a way that is pretty certain to cripple it unless something is done. At the same time it is plain that the government has the welfare of the service at heart, for many improvements are in progress, so that nothing is needed but the proper setting forth of the condition of things by the right people.

That there is much to encourage the friends of the service is shown by the numerous improvements in progress. The Cleveland station is to have at once a fine new station house, better, no doubt, than has been provided for any crew so far on the lakes. Buffalo and Erie have the heavy 34-foot life-boat in their equipment, and as soon as the new station at Cleveland is finished one will, no doubt, be stationed there. It is the plan to equip the stations at Marblehead, Charlotte and Oswego with the same boat, thus practically covering lakes Erie and Ontario with a craft that is good for all weather and also suitable for the rescue of a large number of people at one time.

Two or three of the stations of the district are furnished with telephones and it is expected that in a short time one will be put in at the Buffalo station and a line will be built from Youngstown, N. Y., to the new Fort Niagara station at the mouth of Niagara river. The Buffalo station house and other accessories are getting out of date, being especially unsuited for the easy and rapid handling of the boats and the plan is to duplicate the Cleveland station here soon. An official of the department has already been here and will report in favor of the new buildings. The plan is to cut down the south pier at the mouth of Buffalo Creek several feet, as the extension of the breakwater has made the present height of some 12 feet above water quite unnecssary. It has also made the shoal water south of the pier available for building, and the intention is to move the station out some distance towards the end of the pier, thus affording a much better view to the lookout especially down the Niagara, and also to escape much of the smoke of the city. Major Symons, United States engineer, has already under way buildings for the increased equipment of the engineering and general light-house service of his district, so that the government property here will soon be a center of greatly increased activity and efficiency.

All this is well and as it should be. Now comes the complaint. It all comes out of the revamping of the law governing the pay of the men. It was bad enough as it used to be, as it permits a station keeper who has worn himself out in the service till he is disqualified and displaced, to be turned out, usually unable to earn his living, with but two years' pay ahead of him. Every effort to place these men on the retired list has failed. Then the pay of the surfmen was cut down by the law that was primarily intended to affect the ocean service. It was not so great a reduction, being only $5 a month, but it has the peculiarity of applying only to men who have served eight and a half months in the year or longer. These get but $60 a month, while those serving a shorter time get $65. So it quite often happens that the long-term men get less than others, who are just within the limit. The law is a bit of patchwork that ought not to stand, especially as it is creating havoc with the service. Already this season, with the return of good business on the lakes, fully 10 per cent. of the men in this district have resigned. They are, of course, the best men in the service. Then there are so much fewer applications for examination that there is danger of doing the entire service great injury unless something is done to make it more attractive to the average able seaman. Who is going to take the matter up?

NORTHWESTERN GRAIN OUTLOOK.

Duluth, Minn., July 17.—One of the leading vessel agencies here has just sent out the following summary of the grain situation:

"Reports of vessel charters being made at 4 cents for September are without foundation. They were due to telegrams advancing the opinion that 4 cents could probably be secured for September or October, shippers' option. The grain acreage in the Dakotas and Minnesota is undoubtedly the largest in the history of these States. It is, of course, impossible at this time, to forecast the outcome of the northwestern crop, but reports to local grain receivers are almost uniformly favorable. There is an especially large crop of flax. We understand that a considerable quantity of corn from the southwest will seek an outlet this way during August and September. This will have a helpful effect upon our grain market, as August is usually the dullest shipping month of the season.

"It is unlikely, however, that the present active movement of grain from this port will continue up to the period of new grain. For more than a month the daily receipts have exceeded one-quarter million bushels. The country has practically ceased shipping and grain now arriving in Duluth is being drawn largely from Minneapolis stocks. The diminution in receipts must have a palpable effect on shipments, as the quantity in store, about seven millions, is less than two million bushels in excess of grain stored here July 15, 1898. A good deal of the wheat is controlled by the elevators, who will hold it until September for the carrying charge. This largely limits the market to coarse grains, of which there are less than two million bushels in store."

Alterations to the United States cruiser Raleigh, which will occupy over a year and cost $245,000, will be similar to those approved for the Cincinnati, including the installation of eight water tube boilers, rearrangement of fire room hatches, removal of considerable wood, laying of new decks, docking and painting.

Dry dock No. 2 at the Brooklyn navy yard, for the repair of which $300,000 was appropriated by the last congress, was so badly damaged during a recent storm that it cannot be used again for fully two years. The bottom of the dock on the eastern side bulged for a distance of over 50 feet.

MOSQUITO FLEET IN THE PHILIPPINES.

The navy department has since the battle of Manila secured a respectable-sized and very efficient mosquito fleet in the Philippines. This auxiliary fleet consists, all told, of twenty-seven vessels—the thirteen vessels purchased by Gen. Otis and turned over to the navy department, and the nine vessels captured by Dewey and refitted for service, as well as three tugs, a steam launch and a steam barge, also acquired by purchase. Only four of the fleet are of steel. It is stated that in no case will any change be made in the names of these vessels, at least for the present. The vessels purchased from the Spanish government are, as has been stated, thirteen in number—twelve gunboats and one torpedo boat. The gunboats are the Calamianes, Mariveles, Bulusan, Pampanga, Paragua, Samar, Albay, Manileno, Panay, Vasco, Urdaneta and Guardoqui. The torpedo boat is the Barcelo. In addition to these the fleet in the Philippines has been increased, by purchase or capture, by the tugs Rapido, Sureste and Petrelita, the steam launch Iona and the steam barge Ondina. The nine vessels captured by Dewey are the Don Juan of Austria, the Isla de Cuba, the Isla de Luzon, the Manila, El Cano, Callao, Leyte, Mindoro and Mindanao. Most of these are gunboats of light draught. The Don Juan, Cuba and the Luzon have been repaired and put in first-class condition at Hong Kong, and it has been reported to the navy department that El Cano, also at Hong Kong, will be ready this month for receiving her armament.

The best of the thirteen vessels purchased are the sisterships Bulusan, Pampanga, Paragua and Samar. They are steel gunboats of 8 feet 2 inches mean draught, built in 1895. Each is 114 feet 9 inches long, 135 tons displacement, is credited with a speed of 10 knots and has a single screw. The armament of each consists of one 3.5-inch Sontor Hontoria breech-loading rifle, one 2.7-inch Hontoria breech-loader and two machine guns. These are the only purchased vessels constructed of steel, the others being of wood or iron. The largest of these new American warships is the Albay. She is built of wood, has two screws, displaces 251 tons and has a speed of 9 knots. Her armament consists of one 3.5-inch Hontoria breech-loader, one 3-pounder breech-loader and two machine guns. This vessel was recently engaged in operations against the insurgents in the island of Luzon. The Vasco and Urdaneta are tiny gunboats of only 28 tons displacement each. They are sisters, built in 1883 and 1884. They are constructed of iron and each has a single screw, is 60 feet long, draws 3 feet 10 inches mean and can make only 7 knots an hour. Each has a battery of one 2.9-inch Hontoria breech-loading rifle and one machine gun. The oldest of the purchased gunboats is the Manileno, built in 1877. She has a wooden hull, is driven by one screw, is credited with 9 knots speed, displaces 142 tons, and is armed with three 3.5-inch Hontoria breech-loading rifles. The Calamianes was built in 1886. She is of iron, has two screws, is 91 feet 9 inches long, 6 feet 6 inches mean draught and displaces 151 tons. Her armament consists of one 3.5-inch breech-loading rifle, one 2.7-inch breech-loading rifle and two machine guns. The Mariveles is a sister of the Mindoro captured by Dewey. She was built in 1886. Her hull is of iron. She is 98 feet 6 inches long, draws 6 feet 6 inches mean, has a displacement of 142 tons and is driven 10 knots an hour by a single screw. Her battery consists of one 2,7-inch Hontoria breech-loader and four machine guns. The Panay, built in 1885, has a wooden hull. Her displacement is 145 tons and she has twin screws, which give her a speed of 10 knots. Only one gun, a 3.5-inch Hontoria breech-loader, comprises her battery. The Guardoqui, built in 1884, is an iron gunboat, 69 feet long, 5 feet 3 inches mean draught, 41 tons displacement and makes 8 knots with her single screw. She has one 2.9-inch Hontoria breech-loader and one machine gun.

BUSY AT THE NIXON YARD.

More than 400 men are now employed at Lewis Nixon's Crescent Ship Yard, Elizabethport, N. J. The torpedo boats Nicholson and O'Brien, building for the United States government, are well under way. The finishing touches are being put on the steam yacht Columbia, building for J. Harvey Ladew. She is 195 feet over all, 33½ feet beam, 20 feet depth and 10 feet draught, and will be fitted with triple expansion engines calculated to drive her at a speed of 14 knots. The progress of work on the United States monitor Florida is quite satisfactory and also on the yacht building for Thomas W. Lawson of Boston, Mass. This latter vessel, which was designed by Tams & Lemoine of New York, is 179 feet over all, 148 feet water line, 23 feet beam, 13½ feet depth and 10 feet draught. She is a single-screw vessel of 750 horse power.

Lewis Nixon is known as one of the foremost builders of novel and unique craft of every descripton. The Holland submarine boat was constructed at his yard and he was a pioneer in the construction of the light-draught steam vessels for Alaskan service. Among the novelties at the Crescent works just now is the floating safe for the transportation of money and valuables, which was described in the Review a short time ago, and also what is known as an automatic pulling and weighing barge. The latter is 144 feet in length, 30 feet beam and 13 feet draught. This craft has a capacity of 1,000 tons of coal and can automatically weigh and deliver 300 tons per hour. The tug boat Vigilant, building at Elizabethport for Lieut. Com. Fremont, supervisor of New York harbor, is 112½ feet over all, 98 feet water line, 22 feet beam, 13 feet depth and 8 feet draught. She will be fitted with Wells' quadruple expansion engines of 700 horse power. Mr. Nixon is also building six pinnaces for use in the Russian war vessels now building at the Cramp works, Philadelphia. Two of these little sailing vessels are 56 feet in length, 9 feet 9 inches beam, 5 feet 9 inches depth and 3 feet 8 inches draught. The other four are 40 feet in length, 9 feet 3 inches beam, 5 feet 11 inches depth and 3 feet 8 inches draught.

The war department has awarded to the Wm. Cramp & Sons Co. the contract for repairing and refitting the transport Thomas, designed for service between the United States and Manila. The Cramp bid was $239,500. Proposals have been invited by the department for refitting the Logan.

Minor changes only will be necessitated to fit the former Spanish cruiser Reina Mercedes for service as a receiving ship at the Portsmouth navy yard, to which it is proposed to assign the vessel.

DECADENCE OF THE WELLAND.

A rather interesting observation upon Canada's canal problem has just been forwarded to the state department at Washington by Mr. Harlan W. Brush, United States consul at Cliiton, Ontario. The comments in question are possessed of especial significance just now, in view of the optimism of the Canadians with reference to the St. Lawrence route as it will exist after the deepening of the lower canals to 14 feet, a work now nearing completion. Mr. Brush says:

"The Province of Ontario is becoming alarmed over the seeming decadence of the Welland canal, and strong pleas are being made for harbor improvements at Port Colborne, its Lake Erie terminal. It is urged that the lack of harbor facilities at that port is largely responsible for the loss in traffic. The harbor is in the same condition that it was seventeen years ago, when the Welland canal was opened. The lake vessels now require such a depth of water that none of the larger class attempt to enter Port Colborne. The Welland canal is 26¾ miles in length, connecting Lake Erie and Lake Ontario by cutting through the narrow Niagara peninsula. There is a fall of 326¾ feet in the 27 miles of canal, necessitating twenty-six locks. These locks are 270 feet in length by 45 feet in width. The canal has a depth of 14 feet, and when it was opened it was supposed that provision had been made for the largest lake craft. But the deep Sault Ste. Marie canals and other channel works have permitted the construction of such immense freight carriers that most of the vessels which could navigate the Welland canal have been driven out of the carrying trade.

"When the vessels became too large to enter the Welland canal lightering was resorted to. The Grand Trunk railway built a branch line parallel with the canal. Enough of the cargo was transferred to the railroad to enable the vessel to pass through the canal, and then the cargo was taken on again at the other terminal. This expedient has worked fairly well until recently; but in the meantime the lake vessels have been growing in size each year, and with each increase came lower freight rates, driving the smaller vessels out of competition. Steamers with 200,000-bushel capacity now control the grain-carrying trade, and these can not enter Port Colborne harbor. The vessels that can enter are growing less in number each season, and soon even the expedient of lightering vessels will not suffice to bring traffic to the canal. While the government admits the necessity of a better harbor, it seems unwilling to take immediate steps toward providing one. It is urged that this will prove of only temporary value unless the canal is enlarged as well; and if the canal is enlarged so as to admit the largest lake craft, there would still be heavy expenditures required on the St. Lawrence route, which does not even have a 14-foot channel for its entire length, although that depth is expected to be secured next season.

"The Welland canal, up to date, has cost the government $24,173,352. Its best year in tonnage was 1893, when 1,294,823 tons of grain and merchandise passed through it east and west. Since then the decline in grain shipments has been especially marked, although the grain traffic on the lakes increases every year. In 1893, the grain that passed down the Welland was about 16 per cent. of the grain receipts at Buffalo; in 1898, it was about 9 per cent., or a loss of 43 per cent. as compared with Buffalo. The grain that passed down the Welland last year was less than five years ago, while the grain receipts at Buffalo were nearly three times what they were ten years ago."

PROTECTION FOR OUR COLONIAL VESSELS.

Customs officials at the various ports in Porto Rico and the Philippines have received an order, transmitted by President McKinley through the war department, relative to the issuance of certificates of protection to vessels. Conditions under which protection is conferred are as follows:

First—The vessel must be owned by a citizen of the United States residing in Porto Rico or the Philippines.

Second—Natives of the islands may be given certificates for their vessels upon their taking the oath of allegiance.

Third—If a resident of the islands named was a subject of Spain prior to April 11, 1899, and has abjured his allegiance to the crown of Spain, and has taken the oath of allegiance to the United States, he, too, shall be entitled to a certificate of protection.

The president's order further provides that the master and the watch officers of a vessel to which a certificate of protection is issued must also be citizens of the United States. In lieu of that they must take the oath of allegiance. It is, however, discretionary with the general commanding the forces of the United States in the islands named as to whether these special provisions shall be waived in whole or in part. The certificate of protection entitles the vessel to the same privileges and subjects it to the same disabilities as are prescribed in article 20 of the consular regulations of 1896, for American or foreign-built vessels transferred abroad to citizens of the United States.

Ambassador Joseph Choate, speaking at the banquet tendered by the Lord Mayor of London to the delegates to the international maritime conference, said that American interest was very great in the object of the conference, namely, the unification of the maritime law respecting collisions and ship owners' liability. Mr. Choate expressed the hope that any common result reached would find its effect in legislation by the various maritime nations.

The Maryland Steel Co., Sparrow's Point, Md., has awarded to the Central Iron & Steel Co. of South Harrisburg, Pa., the contract for the steel plate for the three torpedo boat destroyers which they are building for the United States government.

There is a strong possibility that the dynamite cruiser Vesuvius will be transformed into a dispatch boat. The alterations contemplated include a material lengthening of the hull, and would entail an expenditure of about $12,000.

The average speed of the steamer Kaiser Wilhelm der Grosse on her recent record-breaking run across the Atlantic was 22.62 knots, as against her best previous record of 22.56 knots.

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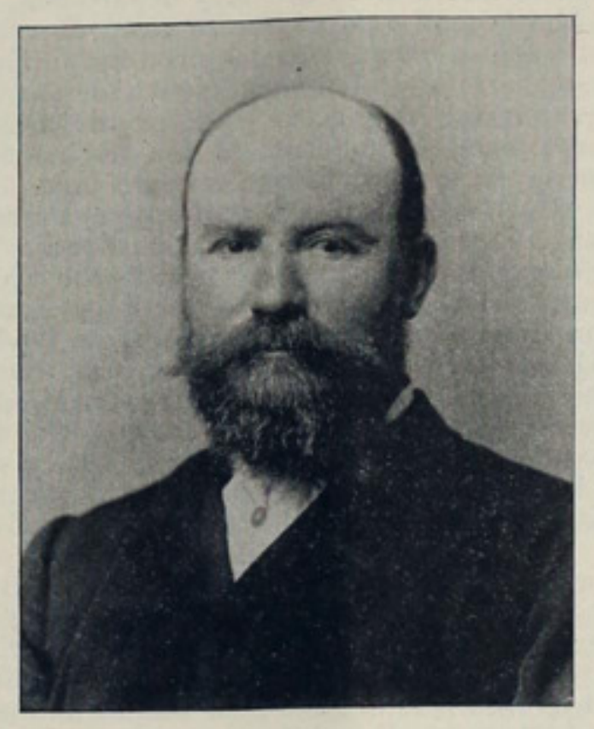
Superintendent Randle of the recently organized New York Ship Building Co., formerly commander of the American liner St. Louis, is a man whose views upon shipping and ship building matters are always worthy of consideration, not the less because of his wide experience than because of his perfect grasp of the entire subject. His idea of the ship of the future is therefore of some moment. Capt. Randle is confident that within ten years we will have ships over 1,000 feet in length, with beam of 105 feet, operated by four screw propellers placed abreast of each other, a plan which he claims could be readily carried out in a vessel of such a breadth, and would moreover be perfectly safe if the screws were properly housed and boxed. The power for these propellers will be obtained he thinks, from engines of 10,000 horse power and the speed will not exceed 20 knots. This opinion as to speed from an experienced navigator and constructing engineer, who has looked after the building of several modern passenger steamers on both sides of the Atlantic, is interesting evidence of the change of expert opinion as regards high speed in Atlantic liners. But like all revolutionary forces the change to greater comfort and less speed will be by no means universal at the outset. Thus we have the Hamburg-American line building a vessel that is expected to exceed everything afloat in speed and the North German Lloyd Co. rejecting a vessel because she failed to make the great speed demanded of her, and casting about with a view to placing a contract for a boat that will even surpass the requirements laid down in the case of the discarded vessel. On the other hand we have the International Navigation Co. and the White Star line, which are among the most progressive of the transatlantic passenger interests, striking out boldly on a course of less speed but compensating for this sacrifice by planning ships that will provide far greater comfort for passengers and at the same time be operated with express-train regularity, though they may not be in the record-breaking class. The White Star line announces its adherance to this policy by stipulations of the contract for the world's largest vessel, the Oceanic, and the International Navigation Co., in placing a contract with the Wm. Cramp & Sons Co. for two new steamers for the American line service, has arranged for vessels larger than the St. Louis and St. Paul, but of three knots less speed. This reduction in the strain imposed upon vessels by the exactions for top-notch speed will undoubtedly be appreciated by the ship and engine builders, by the operating departments of the steamship companies, and perhaps most of all later on by the passengers. It is a decided step in the right direction and the foresight of the pioneers in the movement should redound to their benefit, pecuniary and otherwise. Pregnant with meaning, too, is the assertion of Capt. Randle, during a recent conversation, that seasickness and kindred complaints are directly traceable, in a considerable degree, to insufficient ventilation and the attendant evils which exist on many passenger vessels. In this respect Capt. Randle points to the St. Louis, the ventilation of which, he says, is practically perfect and which he rightfully characterizes as a floating hotel in other respects. It stands to reason that with great speed it is practically impossible to avoid the shaking of the ship which has much to do with seasickness Whether or not the century soon to dawn will slow down in its methods of life and the conduct of business may well be doubted, but that it will demand a slower movement in transatlantic travel seems quite probable. The grill room, the gymnasium and the children's nursery, which are announced as features of the speediest of the "flyers" now building, are doubtless all very well in tneir way, but it is many chances to one that they cannot win in popular favor against the opportunity for greater safety and the provision of comforts for the passengers more important than these fads. It may be noted in passing, also, that Capt. Randle is of the opinion that the day of driving passenger vessels by electricity is far off. He is also firm in the conviction that the plan of arranging propellers along the sides of an ocean liner is entirely impracticable.

Members of the Nicaragua canal commission and a large force of assistants will in the near future start upon what it is to be hoped, will be the last of these "preliminary" expeditions. The "investigation" phase of the isthmian canal project seems to bid fair to be seriously overdone, if the policy which has prevailed in the past is to be pursued much further. There have been surveys and resurveys, investigations official and unofficial, and all that has thus far grown out of the whole matter is a greater diversity of opinion than ever on the subject, as might indeed naturally be expected in view of the widely-varying opinions held by persons who pose as authorities, by reason of associations more or less remote with the project. It would seem that the time has come when it will no longer be a virtue to appease the advocates of the canal in each successive congress by an appropriation for another investigation of the whole subject. The present investigation will no doubt contribute in a high degree to the government's fund of information on the subject of a waterway across the isthmus. But there should certainly be enough reliable information in the conclusions of this last board of engineers to warrant a final settlement of the canal question. According to present arrangements, the Panama committee, selected from the commission, is to go to Paris within a few weeks to look over the company's books. Thus the start of the entire commission for the isthmus may not be made before November. When the commission takes the field it will divide into three parties, one to study the Panama route, one to further investigate the Nicaragua route and the third to go over the Darien line. Later it is probable the availability of the San Blas and other minor routes may be taken up.

SUPERINTENDENT W. G. RANDLE.

The new title which Capt. W. G. Randle, late commander of the American line steamer St. Louis, has acquired since his affiliation with the recently organized New York Ship Building Co., affords a better index to his capabilities than that by which he has been known during the quarter of a century spent in the employ of interests now controlled by the International Navigation Co. Mr. Henry G. Morse, president of the New York Ship Building Co., and who was up to a short time ago one of the principals of the Harlan & Hollingsworth Co., of Wilmington, Del., has entrusted to Mr. Randle much of the responsibility for the arrangement and equipment of the $3,000,000 plant to be laid out at Camden, N. J. That a better choice could have been made is unlikely. Capt. Randle has at various times been in command of the best vessels of the International Company's fleet, but this statement does not cover the scope of his experience, as he has superintended the construction of some of the finest of the Atlantic passenger liners, and has been fully in touch with ship building operations both in England and in this country. Capt. Randle entered the service of the International Navigation Co.—or rather one of the predecessors of the present organization—in 1873 and was at once detailed to the Cramp ship yard, Philadelphia, to assist in fitting out the steamer Ohio, then building there. In 1874, after the American line passed into the management of Peter Wright & Sons, of which firm Clement A. Griscom, now president of the International Navigation Co. was the general manager, Capt. Randle was transferred to the command of the steamer Vaderland of the Red Star line. In 1876 he went to the Nederland of the same line. Two years later, in 1878, he was sent to the yard of the Barrow Ship Building Co. in England, to superintend the construction of the steamer Rhynland, which he commanded until 1883, and then was ordered to the Laird ship yard at Birkenhead, England, to superintend the construction of the steamers Westernland and Nordland, the former of which he commanded until 1887. His next assignment was to superintend the fitting out of the Paris and the construction of the Friesland at the Clydebank yard of Messrs. Thompson. The last mentioned vessel he commanded until 1892. With the transfer of the Paris to the American flag he went with that vessel and remained in her until 1895, in which year he was sent to the Cramp yard to superintend the construction of the St. Louis and St. Paul. He remained in command of the St. Louis until he resigned to take his present position, and during the Spanish-American war acted as navigating officer of the St. Louis.



Superintendent Randle has taken hold of the work of establishing a new and important ship building plant on the Delaware with the earnestness and vigor that have characterized his whole career. Orders for machinery already placed are sufficiently large to justify the opinion that the new company will have a magnificent equipment of tools. Among a list of concerns that are to supply machinery are the following: Bement, Miles & Co., Philadelphia; William Sellers & Co., Philadelphia; Hilles & Jones Co., Wilmington, Del.; R. W. Wood & Co., Philadelphia; the Niles Tool Works, Hamilton, O.; L. W. Pond Machine Co., Worcester, Mass.; Browne & Sharpe Manufacturing Co., Providence, R. I.; Detrick & Harvey Machine Co., Baltimore, Md.; Pratt & Whitney Co., Hartford, Conn.; Jones & Lamson Machine Co., Springfield, Conn.; Lodge & Shipley Machine Tool Co., Cincinnati, O.; Acme Machinery Co., Cleveland; U. Baird Machine Co., Pittsburg; Fairbanks Co., New York; Hendy Machine Co., Torrington, Conn.; Landis Tool Co., Waynesboro, Pa.; Prestice Bros. Co., Worcester, Mass.; Lucas & Gliem Machine Works, Philadelphia; J. A. Fay & Co., Cincinnati; Newton Machine & Tool Works; and Pawling & Harnischfeger, Milwaukee, Wis.

STATISTICS OF LAKE COMMERCE.

MR. O. P. AUSTIN, CHIEF OF THE TREASURY DEPARTMENT BUREAU OF STATISTICS IS GIVING ATTENTION TO THE SUBJECT—WHY CUSTOM HOUSE REPORTS ARE NOT COMPLETE.

Mr. O. P. Austin, chief of the treasury department bureau of statistics, made a trip through the great lakes region a short time ago, for the purpose of learning why the government is not in possession of complete statistics of lake commerce. Mr. Austin talked with Mr. C. H. Keep, secretary of the Lake Carriers' Association, with most of the collectors of customs on the lakes, with the editor of the Marine Review and others who are familiar with the subject. Since returning to Washington, he has been in communication with Mr. Keep and with this office regarding the difficulties encountered in statistical work on the lakes. The cause of incompleteness in custom house statistics, especially at intermediate lake ports, and the subject of statistics of lake commerce generally, is well set forth in the following letter to Mr. Austin from Mr. Keep, who is one of the few men on the lakes thoroughly acquainted with the subject:

"I have carefully considered your letter relating to the gathering of statistics of lake commerce. This is a subject in which I am very deeply interested, and it is my earnest hope and the hope of all members of the Lake Carriers' Association that at last the bureau of statistics will take up the statistics of the lake commerce in such a way as to give all the main facts in the case, even if the smaller items have to be disregarded for the present.

"I think, however, that you underrate the difficulties in the way of

this work, and that you do not quite understand what the chief trouble has been and is. I note that you say you have found on consultation with collectors that each collector has statistics of the quantity of each of the principal commodities brought into and taken out of his port; that these records are kept at each of the cities having a collector, while at the sub ports the records are kept and forwarded to the collector in whose district they are located, and that it is thus possible to show the quantity of each of the leading articles received at and shipped from each port, without reference to the port of origin of the receipts or the port of destination of shipments. I do not understand that the collectors at the various ports have the figures which you mention. Undoubtedly at Buffalo, Chicago and Duluth the information exists in the custom houses, but let me take for example the port of Toledo. The large business done by the port of Toledo is the shipment of soft coal to upper lake ports. This coal is carried largely in vessels whose down cargo is discharged at Buffalo or some Lake Erie port other than Toledo. Suppose, for example a steamer brings a cargo of grain from Duluth to Buffalo, and while on her way down to Buffalo her agent arranges a charter for the boat to carry a cargo of soft coal from Toledo to Duluth for the return trip. The boat arrives in Buffalo and discharges her grain cargo, clears light from Buffalo for Duluth, stops on the way at Toledo, takes on a full cargo of soft coal and proceeds to Duluth to discharge it. The laws provide that where a vessel clears from one port to another, as in this case from Buffalo to Duluth, she may take on or discharge a cargo at an intermediate port, in this case Toledo, without reporting to the custom house at such intermediate port. The collector of customs at Toledo therefore has no record whatever of this coal cargo, and in the course of a season it is very doubtful whether one-half of the shipments of coal from Toledo, which amount to close to 2,000,000 tons per annum, are recorded at the custom house there. Now of course it is possible that the collector at Toledo entirely outside of his official custom house records, may, in the interest of a correct showing of the business of his port, go outside the custom house and get unofficial records from the owners of coal shipping docks, showing the amount of coal taken on at that port by boats which stopped there as an intermediate port. As a matter of fact, however, very few of the collectors are anxious enough to take additional statistical work upon themselves to do this, and the custom house records at such ports as Toledo, Milwaukee and, to a less degree, Cleveland, Ashtabula and many others, are defective to the extent of millions of tons. You will readily see that the accuracy of the custom house records at lake ports depends therefore upon the geographical position of the port, as to whether it is an intermediate or terminal port. At Buffalo the custom house records fairly represent the business, because Buffalo is at the end of the lake route and vessels cannot stop there as an intermediate port. The same is true of Chicago and at the upper end of Lake Superior, except for the confusion arising from the fact that there are two custom districts in one harbor. Duluth is in the State of Minnesota; Superior in the state of Wisconsin. Superior is, I believe, a sub port of the Marquette district. The sharp rivalry between the two places in commercial matters has always made it difficult to get the statistics of commerce there straight. A vessel carries a cargo of hard coal from Buffalo to Duluth. While on her way west her agent charters her for a load of grain to be taken on board at a West Superior elevator and carried to Buffalo. The boat clears light from Duluth to Buffalo, proceeds to West Superior and takes on a grain cargo. No report is made at the custom house in West Superior of this cargo.

"I think I have made plain the chief cause of inaccuracy of custom house statistics on the lakes and the chief difficulty in the way of procuring from official sources under present laws a report of the lake commerce which is anywhere near accurate, even for the principal commodities. The other sources of error referred to in your letter, namely, the taking out of clearance papers before the actual loading of the cargo and the passing of a vessel between two ports located in one district, are not sufficiently great to cut much of a figure. In fact the business between two ports in the same district is practically nothing, and the taking out of clearance before actual loading, while it results in considerable inaccuracy on particular cargoes, averages up in the course of a month or a season so that the final result is not far from the truth.

"The question therefore for you to solve is to ascertain how the collectors of customs at ports like Milwaukee, Toledo, Cleveland, Ashtabula, etc., can obtain records of the business transactions at the port by vessels stopping there as intermediate ports and not reporting at the custom house. If you confine your statistics to a few of the principal articles, such as flour, grain, ore, coal, lumber, and possibly such articles as copper, sugar, salt, cement, pig and manufactured iron, lath and shingles, there would not be any great practical difficulty in the way of getting substantial accuracy. The collector at intermediate ports would have to supplement his official statistics with unofficial figures of cargoes taken on and off but not reported, which they could obtain from the docks. Take for example the case of Toledo. Probably 95 per cent. of the inaccuracy of the custom house statistics of that port consists of the omission of coal cargoes taken aboard there by vessels not reported. There may be four or five coal shipping docks belonging to as many different soft coal railroads. I do not think it would be difficult for the collector to get from the managers of these docks monthly reports of their shipments. Trade conditions might arise under which one road would not want another road to know just what they were doing, but as a matter of fact each road has methods of keeping track of what the other is doing, and I presume the collector could in almost every case get the information he wanted. Exactly the same situation that applies in Toledo applies in Cleveland and Ashtabula. The principal inaccuracy in the custom house record is the omission of intermediate coal cargoes. At Milwaukee, another important port, which is visited as an intermediate port by vessels bound to or from Chicago, greater difficulties exist. The inaccuracy in the custom house statistics at that port applies not only to coal but to flour and the different kinds of grain, and the collector would have to have the cooperation of not only all the coal receiving docks, which are quite numerous, but also of the various elevators, and even of the local flour mills, which are large shippers of flour.

"Unless the collectors of customs are willing to go out and get unofficial figures to supplement their official figures in the cases I have mentioned, I know of no other way of getting lake statistics which are even substantially accurate for the principal articles, except that which I suggested to you when you were in Buffalo. I think it would be out of the question to get a law passed to compel vessels to report and clear at custom houses at intermediate ports. The essence of the lake business is dispatch, and every lake vessel owner would rebel against a law which would impose delay upon his boats simply for statistical purposes. Boats now stop at intermediate ports, put off some cargo in the middle of the night at their own docks and proceed on their way, the whole transaction occurring during hours when the custom house is closed.

"My suggestion to you in Buffalo was that congress might, however, pass a law requiring the master of vessels loading or unloading cargoes at intermediate ports to fill out blanks furnished by the government, giving the quantity of such cargo loaded or unloaded, classification in case of miscellaneous freight not being so minute as to be burdensome, the master to certify as to the correctness of the figures on the blank form and to leave the form with the person in charge of the dock, whose duty it should be, under penalty of a moderate fine, to forward the statement thus left with him to the proper customs official by mail within twenty-four hours. The government could furnish the official envelopes as well as blank forms. The blanks would thus bring into all custom houses substantially correct statistics of the lake commerce without imposing delay on vessels, or placing upon anybody any duty that he could not be reasonably asked to perform for statistical purposes.

"In answer to your inquiry as to whether the statements of the quantity of principal articles arriving and loading at any port on the lakes, presented from month to month, with comparisons with similar months in earlier years, would prove valuable and interesting, I can say that we feel that these records would be so interesting and so valuable that the government ought not to spare the necessary pains and expense to get them. There is an immense interest in the lake statistics, and I am constantly in receipt of inquiries on this subject which I am unable to answer. I have no doubt your office has the same experience. The fact is that since the report of your bureau in 1891 there has been no attempt made by anybody to compile the aggregate volume of business on the lakes so as to show the total freight carried. The growth of the business since 1891 has been enormous, and the work that was then done ought to be done again, and done under conditions more favorable to accuracy than was then the case, but even if perfect accuracy could not be obtained, I certainly think that your bureau could do no more useful work than to take the matter up again in the same way that it was taken up in 1891, using the custom house statistics for what they are worth and supplementing them by unofficial statistics in the case of intermediate ports from docks and warehouse records. A high degree of approximation can thus be obtained, say within 1 or 2 per cent, as there are many checks that could be applied by which mistakes could be discovered. One of these checks is that each commodity shipped from lake ports of shipment should be accounted for as receipts at the various lake receiving ports on this commodity. Other useful figures to be used for checking purposes are the statistics of the Welland and St. Mary's Falls canals. The figures of St. Mary's Falls canal cover fully 50 per cent of the entire lake traffic.

"The prosecution of this work upon the lines I have mentioned, should, I think, be placed in the hands of some person who is on the lakes, whose familiarity with the business would enable him to detect any great error at once, and who could take it up in connection with some other work that he is doing, in view of the limited fund available. The person undertaking the work should also be in with the people who would have to assist him in the unofficial statistics used to supplement the custom house figures. He would have to have the backing of the secretary of the treasury to the extent that the secretary would issue a circular letter to the collectors calling upon them to furnish the figures in their offices. Most of the collectors compile the figures as they come in, but I found when preparing in 1891 the report referred to above, that in some of the collectors' offices there were a lot of statistics but they were not compiled, and that when the secretary of the treasury called upon them to furnish me with the statistics in their offices, they replied that they were unable to give the figures unless they were furnished with additional clerical assistance to compile the figures. I had quite a tussle with two or three collectors, but finally got the figures from all of them, but I needed the support of the secretary of the treasury, and could not have accomplished the results without it. I trust I have made four points particularly clear:

"First—That the collectors at many of the lake ports have not in their offices any records showing accurately the receipts and shipments of principal articles.

"Second—That in the present condition of the law it is necessary to supplement and correct the custom house figures at all intermediate ports with unofficial statistics obtained from dock and warehouse records.

"Third—That a person entirely familiar with the lake commerce can, without great difficulty, supplement the official figures at intermediate ports with unofficial figures, getting with substantial accuracy the movement of principal articles.

"Fourth—That the law exempting vessels from reporting cargoes laden and unladen at intermediate ports might well be changed by requiring the master of the vessel loading and unloading cargoes at such ports to leave a written report of the cargo so handled to be forwarded to the proper customs officer, but that the law should not be changed by requiring vessels to enter and clear at intermediate ports, thus subjecting them to considerable delay for statistical purposes."

"Metallic packing has been 'on trial' since the birthday of the marine engine" is a characteristic sentence in a well-written, neatly printed pamphlet on "Packings," just issued by the United States Metallic Packing Co. of Philadelphia, the management of which makes an engineering specialty of packing valve stems and piston rods on steam engines, air compressors, etc., for all pressures from 2,500 pounds down to vacuum. The pamphlet is so spicy in reading matter and the engravings are so well printed that it is bound to be read by everybody who sees it. Metallic packing manufactured by this company needs no introduction to the marine trade.

A new generating set has been perfected and will very shortly be placed on the market by the Quaker City Electric Co. of Philadelphia.

STATISTICS OF THE WORLD'S SHIPPING.

The latest data on the subject of the growth and magnitude of the shipping of the world is contributed by advance sheets of Lloyd's Register, soon to be issued. According to this volume, the total of the world's tonnage foots up 27,673,528 tons, of which the United Kingdom and the colonies own no less than 13,988,508 tons, or more than one-half. Next in order comes the United States, with less than 2,500,000 tons, and Germany makes a close third. The following table shows the relative importance of the different countries owning more than 100,000 tons as regards merchant shipping:

	Tons.
United Kingdom	12,926,924
Colonies	1,061,584
Total British tonnage	13,988,508
United States	2,465,387
Germany	2,453,334
Norway	1,694,230
France	1,242,091
Italy	875,851
Russia	643,527
Spain	608,885
Sweden	605,991
Japan	533,381
Denmark	511,958
Holland	455,609
Austria-Hungary	380,414
Greece	233,643
Brazil	173,967
Belgium	151,842
Turkey	146,553
Chili	107,495
Portugal	101,758
Total other countries	13,385,916

The remaining tonnage—under 300,000—is shared mainly by Argentina, China, Mexico, Peru, Roumania and Hawaii.

The above figures apply to sailing ships as well as steamships, but steam tonnage has about three times the efficiency of sailing ships. Although the latter are rapidly giving place to steamships everywhere, it appears that sailing ships still carry merchandise to the extent of 6,795,782 tons. Great Britain has discarded that mode of conveyance to a very large extent, and of that tonnage the United Kingdom and the colonies only possess 2,269,782. But when the steam tonnage is compared the figures are very different. Great Britain's steamships represent 11,719,247 tons altogether, while those of all other countries combined amount to about 9,000,000 tons. Germany comes next with nearly 2,000,000 tons, the United States being third with less than 1,250,000 tons.

There is one respect in which England is relegated to the second place, and that is in leviathan steamships of a tonnage of 10,000 tons and upward. Here Germany leads, with a total of twenty such steamships, while Great Britain possesses nine only. This preponderance is explained by the stimulus given in Germany to this class of shipping by mail and other subsidies. But when the limit is reduced to 5,000 tons and upward, which affords a proper comparison, Germany drops back to her usual place. Of such vessels Great Britain possesses 250, while Germany owns one-fifth of that number, France eighteen, Japan 14, Russia eight, and the United States three. The leading position of Japan in this respect is a very noticeable feature.

Coming to the statistics of the tonnage added to the merchant navies of the world, by construction or purchase, during the past year, it is found that for the United Kingdom the total was 1,295,415 tons. Although Great Britain did not have any new vessels built abroad, she purchased 70,000 tons of old tonnage from foreigners. Other countries, however, commissoned British ship builders to build for them, and Great Britain built 13,026 tons for France, 79,629 tons for Germany and 50,516 tons for Norway. Great Britain also sold 600,000 tons to foreigners. The following table indicates the output of all countries for 1898:

Country.	Vessels.	Tonnage.
United Kingdom	690	1,303,894
United States	140	169,196
Germany	83	136,186
France	41	53,483
Italy	20	26,806
Norway	29	23,586
Japan	85	22,412
Holland and Belgium	28	19,862
Denmark	20	10,529
Sweden	22	6,034
Austria-Hungary	9	5,363
Russia	15	3,133
Other countries	8	1,407

Against the additions to Great Britain's merchant navy must be put the tonnage removed or lost. About 600,000 tons were sold to foreigners, as already mentioned, and more than 300,000 tons disappeared by losses at sea and otherwise; but after making allowance for all this, the increase for last year amounts to 209,293 tons, which brings the total British tonnage up to nearly 14,000,000 tons.

Charts of all kinds are sold by the Marine Review Pub. Co., Cleveland, but a few new ones are recommended particularly just now. All are engineer charts. One covers Lake Michigan in a single sheet, and the others covering the St. Mary's river, are made from a general resurvey of that busy waterway.

Ill health compels the retirement of Capt. George A. Gaylord, for nineteen years keeper of the light-house at Long Tail Point.

NEW SHIPS OF WAR.

PROGRESS ON FORTY-EIGHT VESSELS NOW BUILDING FOR THE UNITED STATES NAVY—THIRTEEN OTHER VESSELS AUTHORIZED BUT NOT YET BEGUN.

From the regular monthly statement issued by the bureau of construction and repair, navy department, showing progress to July 1 on the various naval vessels under construction in the ship yards of the United States, a summary may be made of the new ships that will soon be added to our navy. The summary shows forty-eight vessels under construction, including eight battleships, one sheathed cruiser, four monitors, sixteen torpedo boat destroyers, seventeen torpedo boats, one training vessel and one submarine torpedo boat. In addition to this list, the last congress authorized the construction of thirteen other vessels, on which work has not yet been started. The new list comprises three battleships, three armored cruisers, six protected cruisers, and one gunboat for the great lakes. The report regarding progress on July 1 of vessels under construction is as follows:

	Contract Speed.	Where building.	Degree of Completion.
BATTLE SHIPS.			
No. 5. Kearsarge	16 knots.	Newport News Works.	92 per cent.
No. 6. Kentucky	16 "	Newport News Works.	90 "
No. 7. Illinois	16 "	Newport News Works	68 "
No. 8. Alabama	16 "	Cramp & Sons	88 "
No. 9. Wisconsin	16 "	Union Iron Works	73 "
No. 10. Maine	18 "	Cramp & Sons	9 "
No. 11. Missouri	18 "	Newport News Works	0 "
No. 12. Ohio	18 "	Union Iron Works	2 "
SHEATHED CRUISER.			
Albany	20 "	Armstrong's, England	80 "
MONITORS.			
No. 7. Arkansas	12 "	Newport News Works	0 "
No. 8. Connecticut	12 "	Bath Iron Works	10 "
No. 9. Florida	12 "	Lewis Nixon, Elizabethport	9 "
No. 10. Wyoming	12 "	Union Iron Works	12 "
TORPEDO BOAT DESTROYERS.			
No. 1. Bainbridge	29 "	Neafie & Levy, Phila.	15 "
No. 2. Barry	29 "	Neafie & Levy, Phil.	15 "
No. 3. Chauncey	29 "	Neafie & Levy, Phil.	15 "
No. 4. Dale	28 "	Wm. R. Trigg Co., Richm'd	10 "
No. 5. Decatur	28 "	Wm. R. Trigg Co., Richm'd	10 "
No. 6. Hopkins	29 "	Harlan & Hollingsworth	20 "
No. 7. Hull	29 "	Harlan & Hollingsworth	20 "
No. 8. Lawrence	30 "	Fore River Engine Co.	28 "
No. 9. Macdonough	30 "	Fore River Engine Co.	25 "
No. 10. Paul Jones	29 "	Union Iron Works	22 "
No. 11. Perry	29 "	Union Iron Works	22 "
No. 12. Preble	29 "	Union Iron Works	22 "
No. 13. Stewart	29 "	Gas Engine & Power Co.	3 "
No. 14. Truxton	30 "	Maryland Steel Co.	4 "
No. 15. Whipple	30 "	Maryland Steel Co.	4 "
No. 16. Worden	30 "	Maryland Steel Co.	4 "
TORPEDO BOATS.			
No. 9. Dahlgren	30 "	Bath Iron Works	97 "
No. 10. T. A. M. Craven	30 "	Bath Iron Works	95 "
No. 19. Stringham	30 "	Harlan & Hollingsworth	78 "
No. 20. Goldsborough	30 "	Wolff & Zwicker,	75 "
No. 21. Bailey	30 "	Gas Engine & Power Co.	57 "
No. 24. Bagley	28 "	Bath Iron Works	0 "
No. 25. Barney	28 "	Bath Iron Works	0 "
No. 26. Biddle	28 "	Bath Iron Works	0 "
No. 27. Blakely	26 "	Geo. Lawley & Son.	37 "
No. 28. DeLong	26 "	Geo. Lawley & Son	37 "
No. 29. Nicholson	26 "	Lewis Nixon, Elizabethport	34 "
No. 30. O'Brien	26 "	Lewis Nixon, Elizabethport	31 "
No. 31. Shubrick	26 "	Wm. R. Trigg Co., Richm'd	35 "
No. 32. Stockton	26 "	Wm. R. Trigg Co., Richm'd	0 "
No. 33. Thornton	26 "	Wm. R. Trigg Co., Richm'd	30 "
No. 34. Tingey	26 "	Columbian Iron Works.	25 "
No. 35. Wilkes	26.5 "	Gas Engine & Power Co.	13 "
TRAINING VESSEL.			
Chesapeake	Sailing vessel	Bath Iron Works	98 "
SUBMARINE TORPEDO BOAT.			
No. 1. Plunger	8 knots.	Columbian Iron Works	85 "

KENNEY FLUSHOMETERS ABROAD.

The Kenney Flushometer Co. of New York, appears to be making excellent headway in the field for the manufacture of sanitary contrivances, an industry in which the English have always claimed pre-eminence. Within the past few days over 300 Kenney flushometers have been forwarded to London, where they are quickly being adopted in the large hotels, public buildings and the like. Several are also being utilized by the great steamship companies. The White Star liners now under construction at Harland & Wolff's yards, Belfast, will be entirely fitted out with them. Six hundred flushometers were exported within the last few days to Sydney, Melbourne and Victoria, Australia. These shipments are made through Henry W. Peabody & Co. The same number were dispatched to Cuba. One hundred were shipped to the City of Mexico, where nearly 2,000 are specified for by architects for installation in buildings now in course of erection there. China, Japan and Honolulu are ordering quite a number. The value of the shipments enumerated above amounts to $37,500, and the company holds unexecuted orders for over $150,000 worth more flushometers for foreign countries.

The cofferdam for the construction of the largest floating dry dock in the world, which the Maryland Steel Co. of Sparrow's Point, Md., is building for the United States government, is now partly enclosed. The piling to support the docking on which the structure will be built is being driven. These piles will be cut off even, so as to support a level flooring of heavy timbers, but before laying the flooring the dock will be closed against the waters of the river. The dock will not, of course, be built on an inclined plane as is the case with ships.

The barge New York, built by Wm. Rogers of Bath, Me., was sold by auction at that place July 13, to Charles W. McArthur, representing the Morrisdale Coal Co. of New York, for $52,900. This is an excellent price for the vessel and her builders are to be congratulated.

LAUNCHES IN MANY SHIP YARDS

The Delaware Construction Co. of Wilmington, Del., has secured the contract for the construction of a dry dock, which it is said will cost $500,000, for the William Skinner & Sons' Co. of Baltimore, Md. The dock will be 650 feet long at the bottom, 678 feet in length at top, 64 feet in width at the bottom, and 125 feet at the top. The entrance will be 80 feet wide at the top and 60 feet at the bottom. The depth from the coping to the sill is 29 feet. The erection of the dock will require 200,000 cubic yards of excavation, 8,000 cubic yards of concrete masonry, 1,200 cubic yards of granite masonry, 2,500,000 feet of sawed timber and 2,500 piles. Work will begin at once and it is anticipated that a year will be required for the construction of the dock. To secure an issue of $300,000 in bonds of a par value of $1,000 each for this improvement, the Skinner company has executed a mortgage for that amount upon its plant. The bonds will pay 5 per cent. and are to run until July 1, 1924.

Capt. Edward Barr, United States engineer at St. Louis, is in possession of bids for the construction of sixty flat boats as follows: Oscar F. Barrett, Cincinnati, O., $29,100; Miller & Schreimer, Dubuque, Ia., $23,580; Ruell C. Arnold, Leavenworth, Ind., $19,140; Ed. J. Howard, Jeffersonville, Ind., $25,320; American Boat Works, St. Louis, Mo., $26,940; Elizabeth Marine Ways Co., Elizabeth, Pa., $22,500; T. G. Isherwood & James Devoy, Davenport, Ia., and St. Louis, Mo., $19,620.

Two small steamers have recently been launched on Sebago lake, Maine. S. D. Leach of Brewer, Me., built the Ivy F., 62 feet long, 14 feet beam, 5 feet depth and 4½ feet draught, with a 28-horse power engine, calculated to drive the boat at a speed of 12 miles an hour. G. A. Harkness of Camden, Me., has built a steamer, not yet named, which is 56 feet over all, 13 feet beam, 4 feet 9 inches depth and 4 feet draught. This vessel will have engines of 30 horse power.

A novel feature of the launch of the steamer Chester W. Chapin, building at the yard of the Maryland Steel Co., Sparrow's Point, Md., is found in the fact that the boat went into the water with all machinery in place and practically complete. This vessel, which has been described in previous issues of the Review, is 324 feet on deck, 310 feet water line, 48 feet beam, 64 feet breadth over guards, and 17 feet depth. She is equipped with a complete outfit of Blake pumps.

The Wm. Cramp & Sons Co. has about 4,600 men employed at the present time, while the Neafie & Levy Co. of the same city is carrying a force of 1,400. At the Cramp yard the Plant liner is in frame, and frames are also in position for the two steamers building for the Pacific service of Spreckels & Co. of San Francisco. At the Neafie & Levy plant work has been commenced on two tugs for A. J. Newberry of New York.

The Atlantic Works, East Boston, Mass., has launched the tug James Woolley, building for the Commercial Wharf Towboat Co. The new boat, which is of wood and designed for harbor and bay towing, is 82 feet over all, 19 feet beam, 9½ feet depth, and will be fitted with compound engines with cylinders of 14 and 30 inches diameter and 20 inches stroke.

The Neafie & Levy Co. of Philadelphia has begun work on the new steamer for the Weems Steamboat Co. of Baltimore. She will be a steel, side-wheel vessel, 200 feet in length, 31 feet beam and 12 feet depth. She will be fitted with triple expansion engines with cylinders of 10, 28 and 45 inches diameter, and will cost in the neighborhood of $200,000.

Work on the steel sailing ship under construction at the yard of Arthur Sewall & Co., Bath, Me., is progressing rapidly, and the vessel will be completed early in September. Work on the 2,200 ton steel bark has, however, been considerably delayed, owing to a scarcity of material.

Keels will be laid at the Roach ship yard, Chester, Pa., within a few days for the two new steamers for the American-Hawaiian line. All the piles in that portion of the yard where the vessels will be laid down have been pulled out and will be replaced with new ones.

H. M. Bean of Camden, Me., has launched the schooner Annie Murray, building for Capt. Clarence Birdsall of Tom's River, N. J. She is 206 feet in length, 43 feet beam, and will carry 2,250 tons of coal. This vessel will cost when completed about $56,000.

Charles H. Sargent of Newburyport, Mass., has been awarded the contract for the machinery of the steam lighter which George E. Currier & Son of the same place are building for the Cape Ann Granite Co.

The Springfield Boiler Co., Springfield, Ill., has just launched the Iota, the largest dredge ever constructed for government work on the Mississippi river. She is 200 feet in length by 72 feet beam.

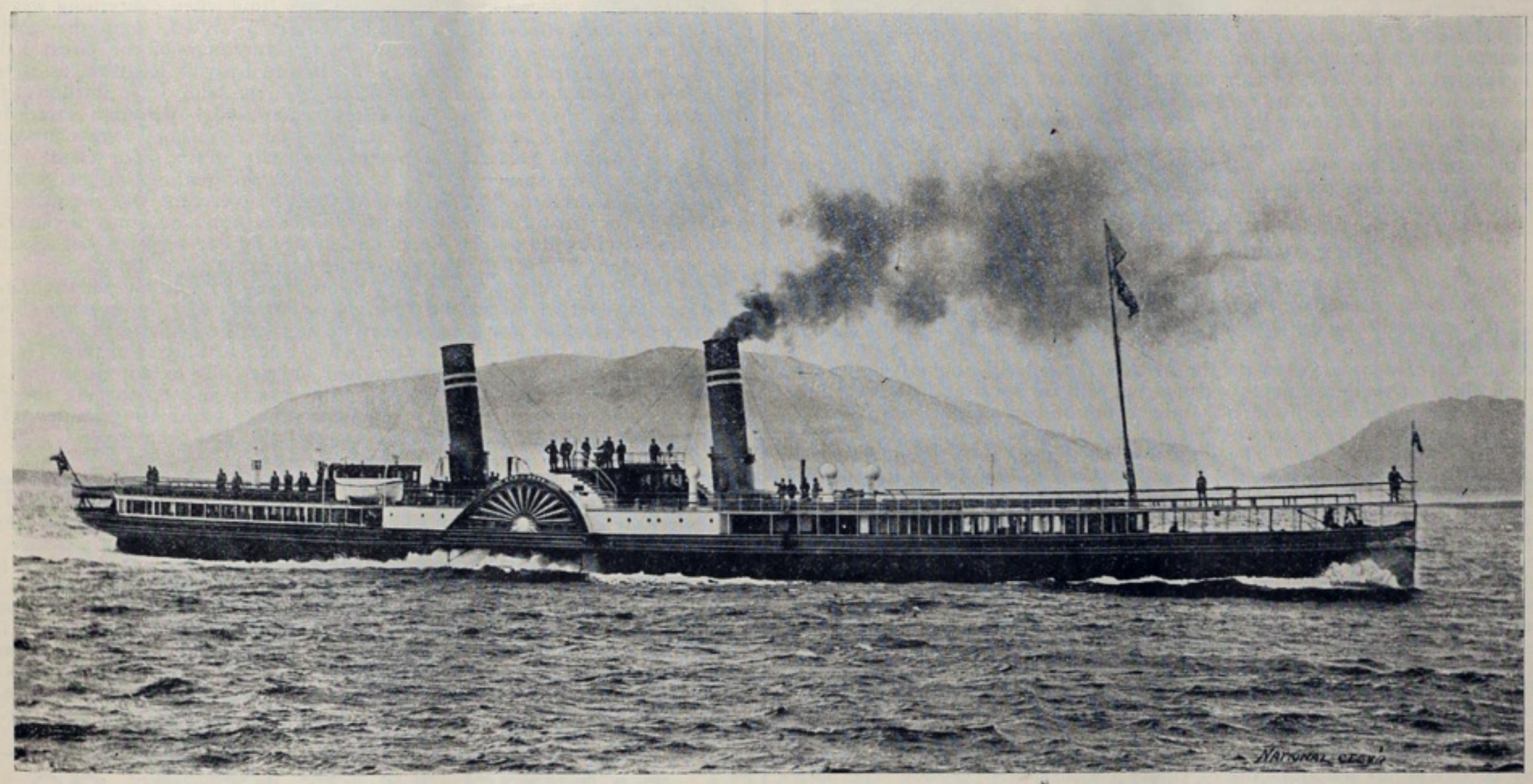
A force of workmen has arrived at Southampton from Glasgow for the purpose of fitting bilge keels to the American liner St. Louis, all the workmen at the former place being fully employed.

The Tangier & Manokin Steamboat Co. of Baltimore, Md., has been incorporated by William G. Sullivan, John S. Mediary, John Spring, Jr., Harry N. Garrison and William T. Spring.

The navy department has awarded the contract for the Mare island dry dock to the Atlantic, Gulf & Pacific Co. at $729,000.

EXAMINATIONS FOR DRAFTSMEN.

The United States civil service commission makes the announcement that on August 15, 16 and 17 examinations will be held in cities of the United States where the commission has boards of examiners, to establish an eligible register for the position of architectural and structural steel draftsman for the navy department. On the first day the examination, which will extend over six hours, will be devoted to mathematics and materials and construction. In making up the total, 10 per cent will be allowed for mathematics and 30 per cent for materials and construction. The eight hours' examination on the second day will be devoted to drawing and design, which is given an allowance of 30 per cent, and the six hours on the third day goes to freehand, ornament and projection, which has an allowance of 20 per cent. In making up the total 10 per cent is also to be allowed to technical education and experience. The minimum age limit for entrance to the examination is twenty years, and all instruments used in the examination must be furnished by applicants. From the eligibles resulting from the examination, certification will be made to the position of architectural draftsman proficient in structural steel work as applied to architectural construction in the bureau of yards and docks. navy deparment. The department has stated that it desires for this position men who are proficient in structural steel work. Persons desiring to take the examination can secure application blanks by addressing the civil service commission at Washington.



A TYPICAL FAST CHANNEL STEAMER—THE KOH-I-NOOR.

Thomas Drein & Son of Wilmington, Del., have received an order from the Newport News Ship Building & Dry Dock Co. for thirty-two patent, beaded, galvanized steel life boats, each 24 feet in length, and for six ocean rafts. They are also shipping two 20-foot boats to the W. & A. Fletcher Co. and have a large number of other orders on hand.

Bement, Miles & Co. of Philadelphia are shipping a large hydraulic riveting equipment for a boiler manufacturing plant at Kobe, Japan. The shipment is estimated to be worth $5,000.

The W. & A. Fletcher Co., Hoboken, N. J., is building eight boilers for the large vessels under construction at the Roach ship yard, Chester, Pa., for Pacific ocean service.

A CONSOLIDATION OF LAKE SHIPS.

What problem along the line of the consolidations, or the formation of large corporations now so general throughout the country is more simple than the purchase by one company of all the better class of vessels on the great lakes that are not owned by the steel or ore companies, or the railroads? In other words, would it not be a simple task, as compared with the formation of the big industrial organizations, to put into one company the property of the so-called "tramp" owners of the lakes —not the low-grade vessels, but the kind of ships that still cut an important figure in the carrying trade? Is it not strange that such a consolidation was not undertaken in the early stages of the great movement in this direction that has swept over the country of late; strange from the standpoint that there is no such complication involved as that which exists in other lines? Probably the answer is found in the statement often made that the men controlling these vessels are a very peculiar class of business men. But then it may seem strange also that when consolidations were under way someone was not far-sighted enough to have corralled in one big organization a very large part of the mining property of the Lake Superior region that the steel companies of the country have been scrambling for since the "boom" came on with the close of 1898. A vessel combination is, however, a probability. The high prices at which vessel property is now held will prove a bar to such an undertaking, but it would not be surprising if something along the lines suggested above is attempted towards the close of navigation. Some of the organizers who have figured in other combinations have had the question under consideration.

The consolidations of today recall to the memory of some of the older vessel men of the lakes the brief history of the Lake Navigation Co., which was a great factor in fresh water navigation late in the fifties. This combination controlled a large number of lake vessels but more especially those trading between Chicago and Buffalo. It was not an organization of the present-day kind, which buys property outright. Each member of the combine retained his ownership in the vessels which he contributed to the fleet, but all finances attendant upon the operation of the vessels were pooled, and members were assessed pro rata for expenses, and were given a dividend at the end of the season, based upon the proportionate value of the vessels which they had in the fleet. The arrangement continued for several years, but it was rather too big a thing for that period and dissatisfaction gradually arose, resulting in the disruption of the company.

THE OUTLOOK FOR LAKE SHIPS.

It is now settled beyond question that there will be no such output of ore from the Lake Superior region as was figured on some time ago, and this notwithstanding the steady advance that has been going on in lake freights. If the truth was known, it would undoubtedly be found that the mining companies, even on the Mesabi range, will not only fall very much short of their estimated outputs but will be very far from meeting actual sales. There will be no sixteen-million-ton output, and in fact there is serious doubt as to whether the total shipments will exceed fourteen and a half millions. The difficulty, of course, is in producing the ore from the mines. But in the meantime the ore companies have gone on paying high freights and hurrying stock-pile ore down the lakes, simply for the purpose of being absolutely certain of avoiding the "boom" that may come on with a heavy fall grain movement. They realize that the movement of freight in all other lines is heavy and that there is no telling how high freights might go in event of a big demand for grain carriers. The soft coal shippers, who are so very much behind in their output, have reason to take some encouragement from this situation as regards the ore, but on the other hand they are met with the conditions as to late shipments of grain which the ore shippers are straining every effort to avoid. It follows therefore that nobody connected with the lake trade is venturing predictions these days. As the freight market has been steadily rising since the first week of navigation, the ship owner refuses to make any engagements for the future, and the situation from day to day is all the time one of more cargoes than vessels. To sum up the present outlook, it may be said that the ore dealer, who has paid advanced freights just as they were required, will have reached much earlier than in previous years the point of caring for only such ore as comes from the mines in daily output. He will therefore be prepared for high fall freights. The coal shipper, on the other hand, is so much behind in shipments that his hopes must rest with a much easier situation towards the close of the season than exists at present. If the general movement of freight keeps up, even on the present basis, coal freights must go to fancy figures and it will be impossible to move by lake the coal that will be required in the northwest.

Messrs. Boynton and Thompson of Port Huron, whose tugs and wrecking appliances are to be taken by the consolidated tug interests, have also sold to J. J. Boland of Buffalo, the steamer Westford and consorts Monitor, Manitowoc and Atmosphere.

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SHIPS WERE NOT CHANGED IN CLASS.

MISTAKEN IMPRESSION AS TO THE CONDITIONS THAT RECENTLY PERMITTED A NUMBER OF WOODEN VESSELS TO ENTER THE GRAIN TRADE.

At a meeting held in Chicago, a short time ago, representatives of the insurance companies interested in grain cargoes agreed that quite a large number of lake vessels that had been previously barred from the grain trade on account of a certain classification adopted by the underwriters early in the season for grain carriers, should again be permitted to carry grain. In other words, the underwriters had fixed up early in the season a tariff for the grain trade that specified certain rates of insurance, according to the class and value of the ship in which the grain was to be moved. This tariff was greatly to the disadvantage of a large number of good wooden vessels that had not been reduced in class but which were very much reduced in value during the past two or three years, on account of general depression in values of wooden vessels. It will be readily understood that previous to the general improvement in business that followed shortly after the opening of the present season, none but the best class of wooden vessels were very highly regarded. Even the vessel owners themselves were of the opinion that in most of the wooden vessels they had some very poor property on their hands. In the Inland Lloyd's Register, which follows the policy of placing a value on vessels, as well as giving them ratings, values were greatly reduced, on account of depreciation of the wooden vessels. Then came the general improvement in lake business and a demand for vessels in all lines of trade. Chicago shippers, who found a large number of vessels barred from the grain trade by high insurance rates on grain which they would carry, soon learned that these vessels were not unfit to carry grain, but that the trouble was due to the tariff charged by the underwriters, who took into consideration the values placed upon the vessels at a time when everything was depressed. They appealed to the underwriters for relief, and the underwriters accordingly called in Capt. F. D. Herriman of the Great Lakes Register and Capt. A. B. Drake of the Inland Lloyd's Register, as a committee, to which was added Capts. D. Sullivan and J. J. Rardon. The situation as above outlined was soon understood. Although values had been reduced, the vessels in question, as far as ratings were concerned, were found to be perfectly competent to carry grain. The Great Lakes Register ignores values and deals only with the qualities of the ship. It was found, therefore, that the condition to be overcome was the matter of values in the Inland Lloyd's Register. It was not a question of changing ratings,which could not be done consistently by any register, but a matter of ship values which had changed in the natural order of things.

"It is very unfortunate," said Capt. F. D. Herriman of the Great Lakes Register in discussing this matter, "that the impression should have gone out that we changed the ratings of the register to meet a demand for more ships in the grain trade. Such a thing is absurd. It was a matter in which we were concerned only to the extent of giving the underwriters information regarding the vessels and comparing the ratings we had given in the two registers after eliminating values. The ratings could not be changed unless a mistake had been made."

Messrs. W. A. Collier, James Davidson and T. F. Newman, who have been acting for the managers of the syndicate of vessel owners that is to purchase all the harbor tugs and wrecking appliances of the great lakes, are understood to have made arrangements thus far for the purchase of all property west of Cleveland which it was proposed to take into the consolidation. A call was made, a short time ago, on subscribers to stock in the consolidation for 20 per cent of their subscription, but it was found later that there was no immediate need of even 20 per cent of the funds, as none of the tugs have actually been bought outright as yet and they will not be turned over until the prices from one end of the lakes to the other are found satisfactory to the syndicate managers. But there is now little chance of failure in the undertaking and it is only a matter of a short time when the consolidation will be a reality.

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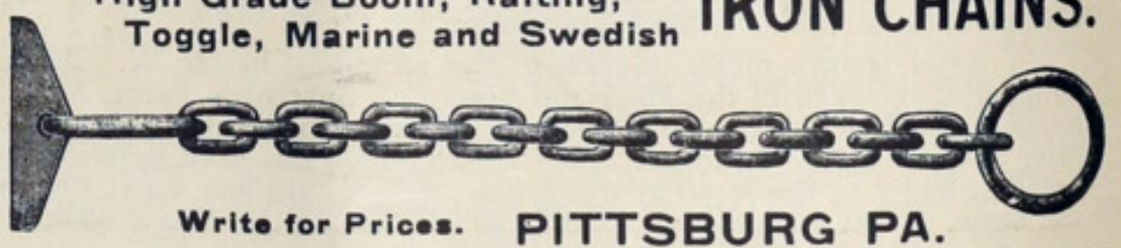
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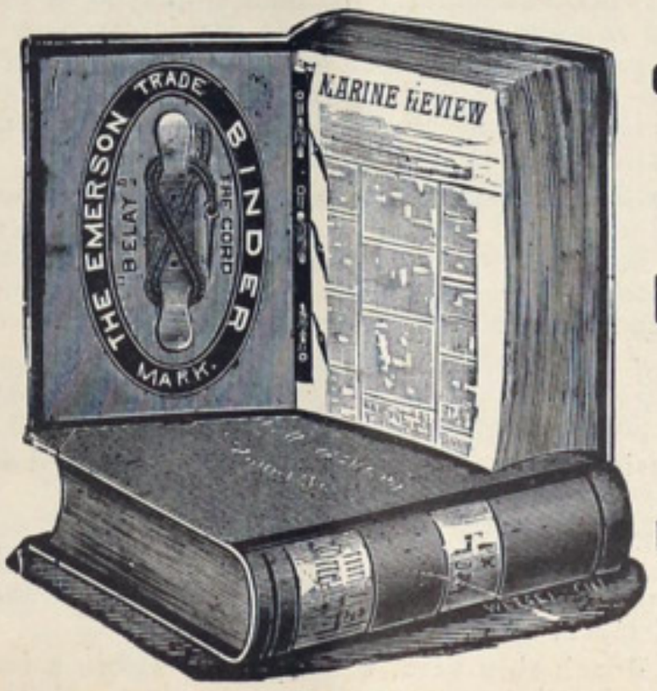

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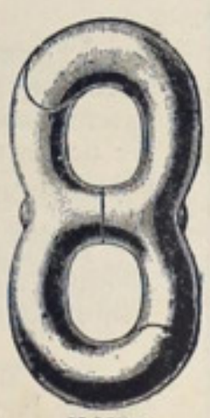
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SALE OF SIX WOODEN VESSELS.

Corrigan, McKinnie & Co. of Cleveland are among the ore dealers who have found considerable difficulty at times during the present season in securing vessels suited to move small cargoes of ore, especially when the ore was to go to Buffalo or to what are known as the smaller ports in the ore trade on Lake Erie. They therefore concluded to secure a fleet of vessels suited to this trade, and have purchased three tows, six vessels in all, that are of about 1,800 tons capacity each. Four of these vessels, the steamers Iron Duke, Iron Age and Iron Chief, and schooner Iron Cliff, were purchased through W. C. Richardson of Cleveland, from Capt. James Millen of Detroit. All four of these vessels are in very good condition, especially the Iron Cliff, on which a very large sum of money was spent for repairs last winter. Capt. Millen of Detroit now has left only two vessels, the Iron King and Iron Queen. The other two vessels acquired by the ore dealers are the schooner F. D. Ewen from H. A. Hawgood of Cleveland, and the schooner John M. Hutchinson, purchased through Hutchinson & Co. of Cleveland, from Charles D. Holland of Marine City. None of the prices announced in connection with these sales are correct. The price of $130,000 given out as the figure at which the Millen boats were transferred, is wrong. The purchasers have seen fit to withhold the figures.

Some thirty steel vessels building on the Atlantic coast, most of them steamships of the highest class for ocean service, are building under inspection of the American Bureau of Shipping, 37 William street, New York, for classification in the Record of American and Foreign Shipping, for which Mr. E. Platt Stratton is chief surveyor. The list includes the following: At the Newport News Ship Building & Dry Dock Co.'s works—Four steamships for Southern Pacific Co., 400 feet long; two steamships for the Cromwell Steamship Co., 400 feet long; two steamships for the Pacific Mail Steamship Co., 550 feet long. At the Wm. Cramp & Sons works, Philadelphia—one steamship for the Plant Steamship Co., 400 feet long; three steamships for J. D. Spreckels Bros., 400 feet long; two steamships for New York & Cuba Mail Steamship Co., 341 feet long. At the Harlan & Hollingsworth Co.'s works, Wilmington, Del.—one steamship for Messrs. Boulton, Bliss & Dallett, Red D Line, 269 feet long; one steamship for Boston & Philadelphia Steamship Co.'s Winsor line, 290 feet long; two steamships for New York & Porto Rico Steamship Co.'s line, 317 feet long; one steamship for the Metropolitan Steamship Co., 271 feet long. At the Neafie & Levy works, Philadelphia—one tug for Philadelphia & Reading R. R. Co., 157 feet long; one steamship for York River & Chesapeake service, 246 feet long. At the works of J. H. Dialogue, Camden, N. J.—one steam lighter for the Grasselli Chemical Co., 96 feet long. At the Burlee Dry Dock & Ship Building Co.'s works, Port Richmond, N. Y.—four steel barges for the J. B. King Transportation Co., 207 feet long. At the works of Arthur Sewall & Co., Bath, Me.—two steel sailing ships for their own account, 328 feet long. At Lewis Nixon's Ship Yard, Elizabethport, N. J.—one steel steam yacht for Tams & Lemoine, 148 feet long. At Erie Basin, Brooklyn, N. Y.—One steel steam yacht for Tams & Lemoine, 130 feet long.

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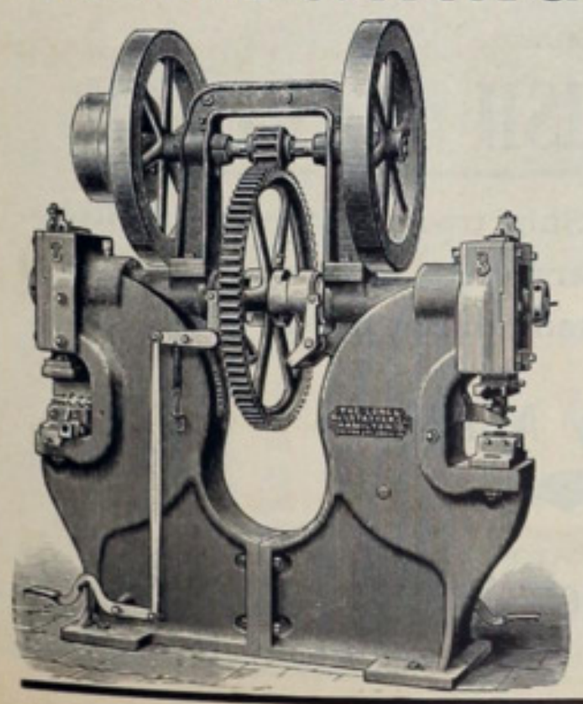

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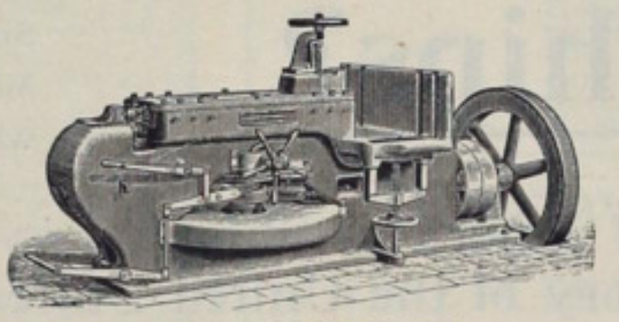

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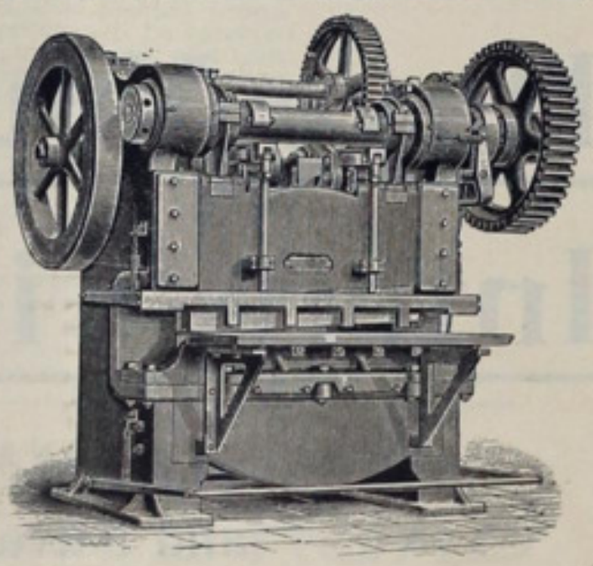

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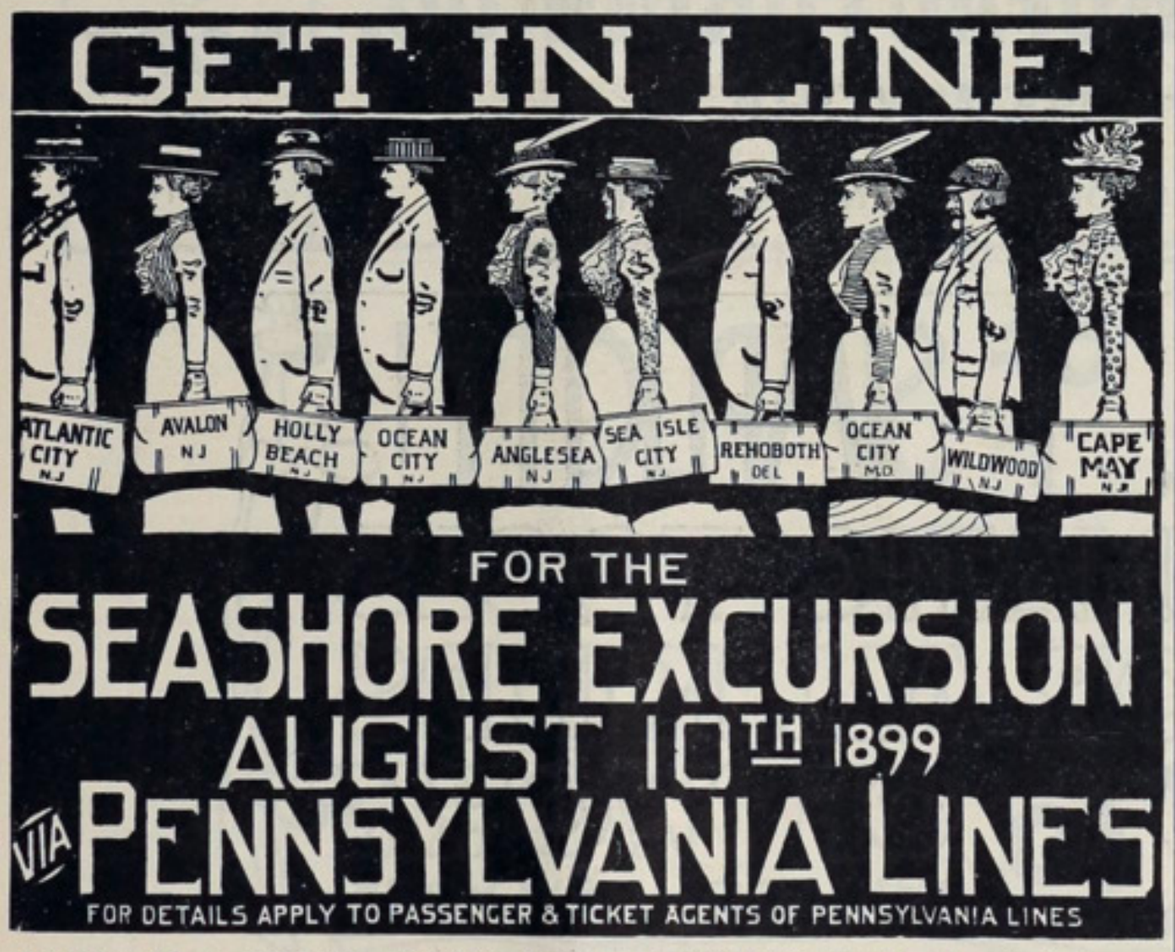

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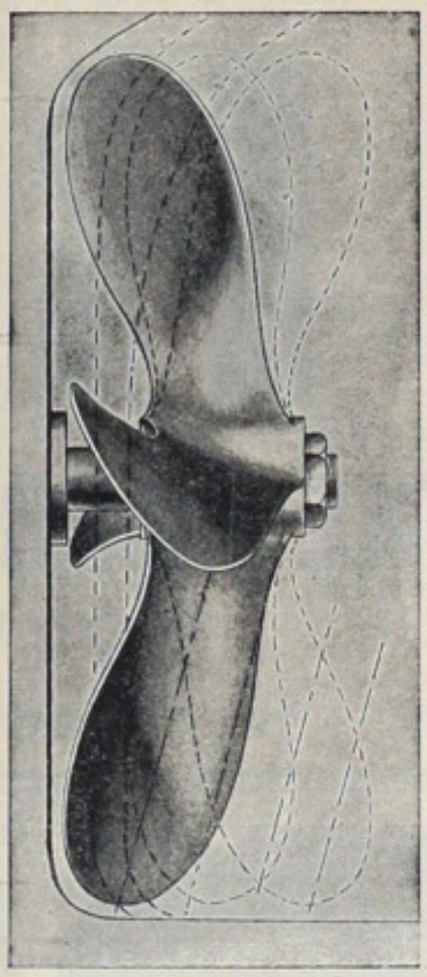

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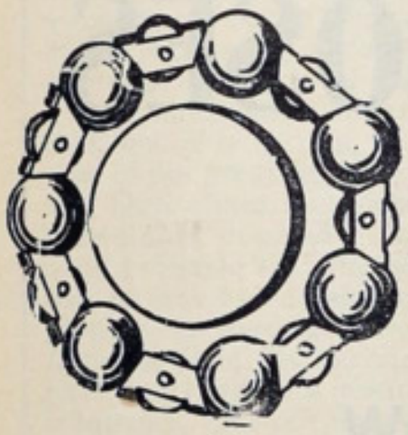

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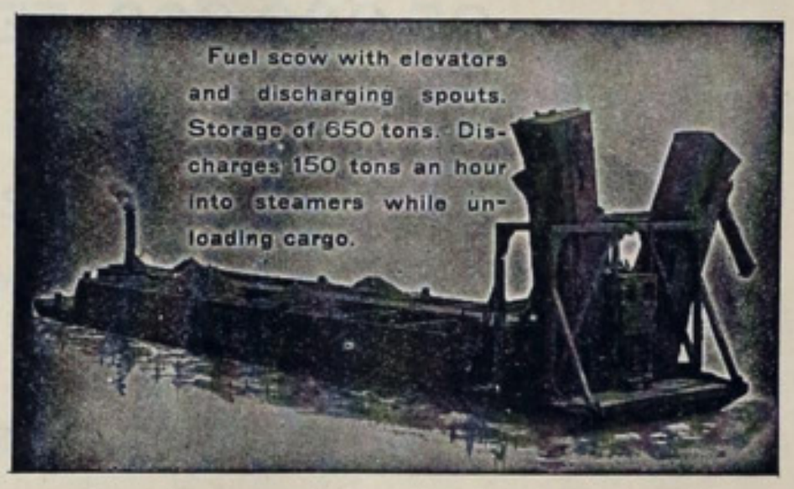
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U. S. Engineer Office, Jones Building, Detroit, Mich., June 30, 1899. Sealed proposals for dredging at Cheboygan and Alpena harbors, and Saginaw, Sebewaing, and Belle Rivers, Mich., will be received here until 12 o'clock, noon (standard time) July 24, 1899, and then publicly opened. Information furnished on application.

G. J. LYDECKER, Lt. Col., Engrs.
July 20

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., July 14, 1899. Sealed proposals for Hydraulic Dredge will be received here until 8 p. m. August 28, 1899, and then publicly opened. Information furnished on application. Chester Harding, Captain, Engrs. Aug. 10.

U. S. Engineer Office, D. S. Morgan Building, Buffalo, N. Y., July 11, 1899. Sealed proposals for construction of timber crib and concrete breakwater at Buffalo, N. Y., will be received here until 11 o'clock A. M. July 26, 1899, and then opened. Information furnished on application. T. W. Symons, Major, Engrs. July 20

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